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THE OPHTHALMIC RECORD

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The August number of the OPHTHALMIC RECORD will contain, among others, an original paper by Charles A. Oliver, "Removal of a Piece of Steel from the Vitreous Chamber, the Position of the Foreign Body being Determined by the Presence of a Scotoma in the Field of Vision;" one by J. H. Claiborne, "A Case of Embolism of a Branch of the Central Retinal Artery;" one by S. E. Cook, "Glioma of the Retina:" one by G. Melville Black, "The Relation of Malpositions of the Macula to Heterophoria."

There will also appear reviews of the most recent contributions to Ophthalmology published here and abroad, book notices, editorials by prominent Ophthalmologists, society reports and miscellaneous items of interest.

The RECORD particularly desires short, practical papers on any subject connected with Ophthalmology. These will be published at as early a date as possible. It is understood that, unless otherwise arranged, original articles when accepted are contributed to the RECORD exclusively. Illustrative cuts will be made at the expense of the journal and proofs for correction will be sent to authors when desired. Reprints with covers are furnished at cost. One hundred of these will be presented to authors *gratis* when a request for them is written on the original manuscript. The RECORD will be issued monthly and each number will contain about 54 pages of reading matter.

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ANGIOID STREAKS IN THE RETINA.—DE SCHWEINITZ.

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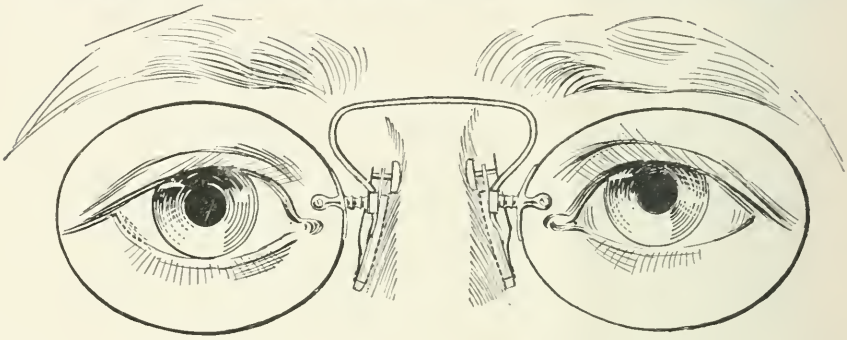

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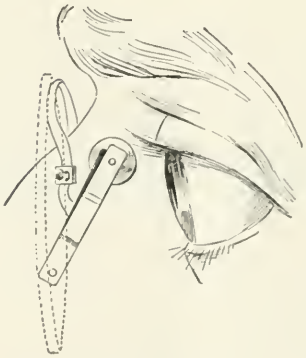

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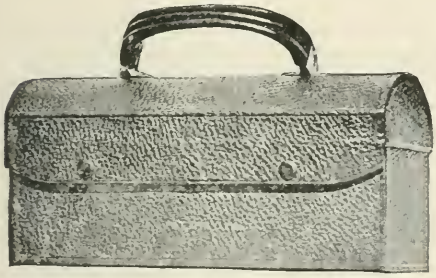

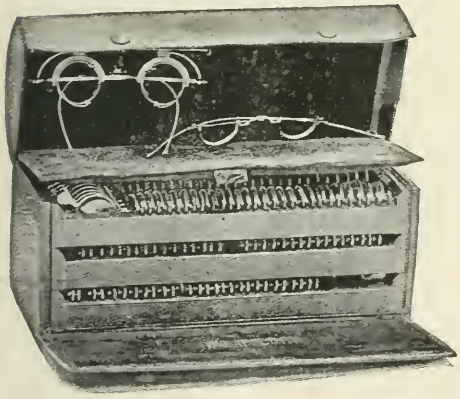

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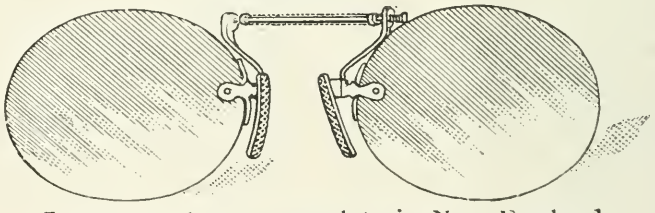

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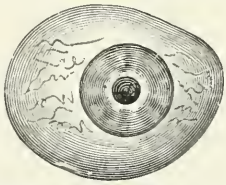

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THE
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VOL. VI. CHICAGO, JULY, 1897. NO. 7, NEW SERIES.

ORIGINAL ARTICLES.

ANGIOID STREAKS IN THE RETINA.—SECOND COMMUNICATION.

By G. E. de SCHWEINITZ, M. D.,
Professor of Ophthalmology, Jefferson Medical College.

(WITH COLORED FRONTIS PIECE.)

Last year, at a meeting of the Ophthalmic Section of the College of Physicians of Philadelphia, I briefly detailed the records of a case of angioid streaks in the retina, and aftewards more elaborately presented a paper on this subject before the Thirty-second Annual Meeting of the American Ophthalmological Society, in New London in 1896.

It will be rembered that attention was first called to this affection by Plange[1] five years ago, and that his communication was followed by a number of others, the more important papers having been written by Knapp,[2] Sydney Stephenson,[3] Ward Holden,[4] Walser,[5] and Pretori.[6] To the series of cases I desire to add another at present under my observation. This patient is the brother of the case which I have reported in the Transactions of the American Ophthalmological Society, Vol. VII, p. 650.

Eli Deily, aged 50, born in Pennsylvania, married, laborer, consulted me on the 30th of October, 1896, on account of failing vision. With the exception of unimportant illnesses in childhood, the patient has been a healthy man. He denies venereal disease of any type. He does not smoke, but chews tobacco. He has been

1. Archives of Ophthalmology, 1892, XXI, p. 282. In 1889, R. W. Doyne (Trans. Ophthal. Soc. U. K. IX 1889, p. 128) published a chromo-lithograph which closely resembles these pigment striae. The case is described as choroidal and retinal changes the result of blows on the eye. The irregularities in the outline of the streaks were attributed to rupture of the pigment layer of the retina.
2. Ibid, p. 289.
3. Trans. Ophthal Soc. U. K., 1892, Vol. XII, p. 140.
4. Archives of Ophthalmology, 1895, XXIV, p. 147.
5. Archiv fuer Augenheilkunde Vol. XXIII; also Archives of Ophthalmology, 1896, Vol. XXV, p. 364.
6. Deutschmann's Beitraege zur Augenheilkunde, 1896, XXIV, p 101.

a hard drinker, and one year before consultation underwent the so-called Keely cure.

His parents are alive and well. He has six living children; two children died of phthisis, one at twenty-four, and the other at twenty-two; two children died in early life, one of rapid phthisis and another of brain fever. His wife is healthy and has no trouble with her eyes. One brother younger than the patient is said to "see badly;" an older brother has typical angioid streaks in the retina. The patient's vision began to fail about two years ago, the imperfection of sight appearing first in the left eye. It has gradually increased until April 1896. Since this time the vision has been exceedingly imperfect. These visual disturbances were unassociated with ocular pains.

EXAMINATION.—The patient is a medium-sized, somewhat prematurely old man, with pallid countenance and the typical look of defective vision.

The *examination of the urine* is as follows:

Light yellow.
Acid.
Specific gravity 1012.
No Albumin.
No sugar.
No bile.
No sediment.
Microscopical examination negative.

Blood examination:

Haemoglobin { 95 per cent. of normal.
{ 13.3 grs. per 100 grs. of blood.
Red corpuscles: 92 Vol. per cent.
4,620,400 per cm.
White corpuscles: 12,500 per cm.
1 white to 370 red.

Microscopical examinations shows all corpuscles of excellent shape. Diligent search failed to reveal malarial organisms (there is a history of malaria.)

A differential count of the leucocytes is as follows:

Lymphocytes,	4 per 100
Mononuclear lymphocytes,	17 per 100
Polynuclear lymphocytes,	78 per 100
Eosinophiles,	1 per 100
Myelocytes,	0 per 100

EYES.—V. of R. E.—counting fingers at 60 cm; of L. E. counting fingers at 50 cm. Each peripheral visual field, form and colors, is normal. The pupils react normally to light and accommodation. The lesions in the backgrounds of the eyes are as follows:

Right Eye.—The optic disc preserves its capillarity upon the nasal side, but presents upon its temporal aspect a patch of atrophic color. It is surrounded by an area of superficial choroidal atrophy. The retinal vessels, both veins and arteries, are about normal in size. Directly in the macular region and occupying a large space of the temporal half of the eyeground is a huge, almost circular hemorrhage, broader and more fringed below, its centre being occupied by whitish and yellowish areas of retino-choroidal atrophy. Chiefly upon the nasal side, and generally following the course of the retinal vessels and lying in plane

beneath them, is a system of branching streaks, somewhat granular in appearance, partly brownish and partly reddish in color. Within the boundaries of the hemorrhage previously noted may be seen another system of streaks, some brownish, and others still fresh and hemorrhagic, and directly connected with and proceeding from the band of blood extravasation which circles this area. Downward and inward from the margin of the hemorrhage may be seen a small patch of similar streaks just beginning to form. The rest of the eyeground is without notable lesion.

Left Eye.—The optic disc is round, the atrophic area being more decided above than elsewhere. It is surrounded by a patch of superficial choroidal atrophy and pigment disturbance. Everywhere throughout the eyeground are numerous anastomosing brownish, and reddish-brown streaks of a character similar to those found in the other eye, but evidently at a more advanced period of their formation. The macular region and temporal half of the eyeground are occupied by a large vertically oval plaque of choroidal atrophy streaked with black pigment. Boardering this, below it and between it and the disc are broad reddish bands, somewhat resembling exposed choroidal vessels. Indeed, in some instances they are representations of the vascular supply of this layer of the ocular coats. (See Figure.) It is evident that the process in the left eye, which was the one first affected, represents a further stage of metamorphosis than the right eye, in which the hemorrhagic nature of the affection and the direct connection of these streaks with the hemorrhages is more manifest.

Remarks.—If at the present time there was any doubt of the hemorrhagic origin of these dark brown, anastomosing bands, the present case, as well as the brother of this patient, already reported to the American Ophthalmological Society, would remove it. As I have already stated when describing the first case, the hemorrhagic nature of the lesions is evident. They may be traced from their origin in hemorrhagic metamorphosis, during the stage in which the formed striae, still partly hemorrhagic in nature, are disposed in characteristic and branching lines, to their later development into true pigment streaks and ridges. In all the other cases thus far reported, with the exception of two, hemorrhages have been present in the retina.

So far as the explanation of these cases is concerned, Plange believes they represent a deposition of pigment in striae in the retina after hemorrhage, followed by changes, probably hyperplastic, in the supporting fibres of Müller. Knapp practically agrees with this explanation, stating that the extravasated blood has been converted into these dark, vessel-like streaks. Stephenson reports his case without comment. Ward Holden concludes that "it would seem warrantable to assume as a hypothesis, to be verified by future observation, that the affection retinitis striata, like that called angioid streaks, arises through the elements of peripheric hemorr-

hages, being diffused in a linear manner in the deep layers of the retina, and undergoing various sorts of metamorphoses." Walser in endeavoring to explain this affection, excludes retinitis pigmentosa, retinitis striata and striae in the retina after detachment, and suggests that a retinitis in the outer layers may be the cause of these pigment stripes. In order to account for the arrangement of the stripes he is willing to suppose that the proliferation of pigment, or the orignal inflamation in the retina, has followed the lymph spaces described by Schwalbe and His,—an etiology already suggested by Ward Holden, who deems it probable that the diffusion may take place, in part at least, through previously existing lymph channels. Both of these authors, however, admit that this hypothesis does not rest upon very secure foundation inasmuch as our knowledge of the lymph channels in the retina is very indefinite. Walser has further suggested as a second possibility that these changes may take their original start from retinal hemorrhages occurring in infants. Pretori, whose case comes between the publication of my first case and the present instance, concludes that it is probable that the lesions may be explained by assuming a congenital anomaly of the retina—an explanation, in the face of the facts previously reported, which is quite untenable.

The extent of the fundus lesions in the various cases reported has differed considerably. In some, for example, Walser's, there was no choroidal disturbance; in others, as, for example, in Stephenson's, Knapp's and my own cases, there was marked choroidal disease.

The present instance is another clinical example of this remarkable metamorphosis of retinal hemorrhages,for there is no manner of doubt of the hemorrhagic origin of the affection. Evidently it can occur under circumstances and with various lesions in the general fundus, one condition only, being necessary for the production of the streaks, namely, a hemorrhage or a series of hemorrhages which are gradually converted into these branching striae. An interesting point, already referred to is that two brothers are affected, with a possibility that a third may have some similar lesion, although it has not been possible as yet to examine his eyes.

THE CURVATURE OF THE CORNEA IN REFERENCE TO THE REFRACTIVE CONDITION OF THE DIOPTRIC APPARATUS IN THE TWO PRINCIPAL MERIDIANS. *

BY FRANCIS VALK, M. D.,

Professor of Diseases of the Eye at the New York Post-Graduate School and Hospital, &c., &c.

(Concluded from June Issue.)

I now come to the most interesting part of these examinations, the relation of the radius of curvature to the refraction of the dioptric apparatus in the two principal meridians; and for which I have taken such a large number that these examinations may be somewhat conclusive as shown in the table.

The first question that may be asked is: What is the normal radius of curvature? or in other words, What radius of curvature do we find generally associated with the normal or emmetropic refraction of the eye? Now we find the radius of curvature in the emmetropic planes, in a large number of the cases, varies between 7.5 mm. and and 8 mm.; within these two radii we have 258 measurements, or about one-fourth of the total number, and if we take the mean of this, we have a radius of curvature of about 7.65 mm. as representing the normal radius; if so, then all radii above that mean will probably be hypermetropic and that all radii below that number will probably be myopic.

At this point I wish to explain what I mean by the emmetropic plane. I would illustrate it in this way, for instance in a case of simple myopic astigmatism, the measurements would show in the vertical meridian a myopia and in the horizontal meridian would be recorded emmetropia.

Bearing these two points in mind, if we take the total figures as shown by the table, we have these results:—

Radius, 7.65 mm. and greater, = 620, of which 213 Em., 350 Hy., and only 57 My. A proportion of only *one in ten.*

Radius, 7.60 mm. and less, = 486, of which 158 Em., 218 Hy., and 110 My. A proportion of *one in three.*

We are justified then in assuming, that the normal radius of curvature is about 7.65 mm., and in making our examination with the

* Read before the Ophthalmic Section of the New York Academy of Medicine, March 15 1897.

ophthalmometer, that if we also take the radius of curvature in the two principal meridians we will have a "clew" or indication of the existing state of refraction. If we find that the radius of curvature is greater than 7.65 mm., then we have an average of myopia of only one in ten; consequently the probability is that the case is *hypermetropic.* On the other hand, if we find the radius of curvature is less than 7.65 mm., then the case is probably *myopic*, as now the proportion of myopia is much larger, namely one in three.

These examinations have been so interesting to me that I long since gave up the method of using the ophthalmometer by the overlapping of the mires and now read off the amount of the astigmatism by the methods mentioned before in this paper.

Of this large number of examinations, 89 corneæ, giving measurements in 178 meridians, showed no astigmatism in any meridians; in other words, the radius of curvature was the same in the two principal meridians. This radius varied in length, but was generally near the normal radius of 7.65 mm.; while the examination by the other objective methods the refraction was found to be hyperopic, myopic or astigmatism "against the rule," and in a few cases emmetropic.

In the consideration of this subject I am led to express some views, I believe to be true, in reference to the curvature of the posterior surface of the cornea.

I am well aware that we have the supposition, that in case the ophthalmometer does not show any overlapping of the mires, that we have no astigmatism, or if so it is "against the rule," that this astigmatism is due to an unequal curvature of the lens, or an oblique position of the lens in its fossa, that will neutralize or overcome the astigmatism of the anterior surface of the cornea; but has this been proved by scientific examinations? or does it not simply depend on the fact, according to Burnett, page 45, that the first person who demonstrated astigmatism, Thomas Young, found or supposed his astigmatism existed in the lens, for the reason that "he immersed his eye in a chamber of water, bounded by a plane glass surface," and the difference in the refraction did not disappear? True, that test would eliminate the anterior surface of the cornea, but could not his astigmatism have existed on the posterior surface, in spite of the alleged fact, that the refractive index of the aqueous is the same as that of the cornea?

Further, Burnett states on page 43 that "a number of eyes with normal vision have been measured as to the curvature of the various corneal meridians and in almost all there was found a meridian of least

curvature (longer radius) and at right angles to this another of greatest curvature (shortest radius). In other words, the human cornea does not represent, by its surface, the section of a sphere with equal radii, but approaches in form more nearly to an ellipsoid with three unequal axes." Yet, in this series of cases I present 89 corneæ that appear to be a perfect "section of a sphere with equal radii," as far as the anterior surface of the cornea is concerned, out of a total of over 500 corneæ examined, giving nearly one-sixth that presented no astigmatism of the anterior surface.

In further support of the view, that astigmatism "against the rule" may be due to the curvature of the posterior surface of the cornea, I find in Norris and Oliver, *System of Diseases of the Eye*, page 218, in an article by G. A. Piersol, M. D., this observation: "The human cornea varies in thickness from .08 mm. at the centre to 1.1 mm. at the periphery when viewed in vertical section." This change in the thickness of the cornea must produce very material changes in the radius of curvature of the two surfaces, and may this difference not be great enough for the curvature of the posterior surface to neutralize or completely change the refraction of the dioptric apparatus in any one meridian?

As far as I know we have no positive knowledge of the astigmatism of the lens, as I am not aware that the curvature of the anterior surface of the lens has ever been measured in any of these cases of marked astigmatism "against the rule," and unfortunately we have no instrument yet devised in which the curvature of the lens can be as readily measured as the anterior surface of the cornea; hence, the statement that the astigmatism "is in the lens" is only a supposition proved only by the fact, that the index of refraction of the aqueous seems to be the same as that of the cornea.

I can readily understand how the pressure of the lids may cause corneal astigmatism in fœtal life, but I cannot see any possible cause for an astigmatism of the lens, as it must be surrounded by a perfectly equable pressure from the time—"the lens sac—which becomes detached from the external epiblast" (Holden, page 5) until it reaches the period of the perfectly formed eye.

To complete this discussion of the radius of curvature I will now refer to some of our text books, that we may compare their conclusions with my own, namely, that the normal radius of curvature is about 7.65 mm.

Donders, page 37, writing about the anterior surface of the cornea,

says, that the radius of curvature averages about 8 mm., and considers the two surfaces parallel, in the region of the apex of the cornea; while according to my table I find only about 50 meridians that measure 8 mm. or over, that show emmetropic refraction. Also we find that Donders states on page 89: "The final result, therefore, remains what we laid down in starting; that myopia usually depends upon an elongation, and hypermetropia upon a shortening, of the axis of vision," and yet, I find a striking relation, that seems to exist, between the radius of curvature of the cornea and the refractive condition of the dioptric media in corresponding meridians. Also in Donders' tables on the same page, he gives the average radius of curvature in about 235 cases, in which his average is constantly higher than my own, and finds very little difference in the radius of curvature between the myopic and hypermetropic cases; yet, do not these measurements of my table seem to show a constant relation between the radius of curvature and the refraction?

Donders' table quoted above gives:

In men—Maximum, 8.396 mm.; minimum, 7.28 mm.; average, 7.858.

In women—Maximum, 8.487 mm.; minimum, 7.115 mm.; average, 7.799.

From this you will note that my maximum measurements are much larger, namely, as high as 8.65 mm, and that my minimum measurements are much smaller, as 6.5 mm., giving me the average of only 7.65 mm., and associated with which we find that the refraction is generally emmetropic.

Landolt gives about the same average radius of curvature as Donders, and considers that nearly all cases of ametropia are due to the length of the optic axis. From this he divides his cases of ametropia into two classes: namely, Refractive, when they are dependent on the refractive conditions of the dioptric apparatus; and Axial, when they are dependent upon the lengthening or shortening of the optic axis. While this may be true, it is impossible to ascertain the antero-posterior diameters of these cases, yet I must note again, the similarity of the curvature of the cornea and the refractive condition, as shown by my table of measurements.

Before closing this paper I wish to state, what seems to be an interesting fact, shown by the method of keeping the record of measurements by the ophthalmometer, that in some of my cases, when I have been able to examine the radius of curvature at different

periods, after the first measurements were taken, by the same instrument and under the same conditions, that in these cases I found the radius of curvature has very materially changed.

This would show that the theory formerly held, that the radius of curvature of the cornea was always the same, is not positively so in all cases.

I will illustrate this by a report of the following cases recently examined a second time:

Case I Mrs. W., age 38 First examined in February, 1894.
Radius—R. E., vertical meridian, 7.45 mm. L. E., 7.25 mm.
Radius—R. E., horizontal meridian, 7.65 mm. L. E., 7.65 mm.
Retinoscopy gives R. E. 1.50 D., L. E. 2.50 D. hypermetropia with hypermetropic astigmatism. Vision with glasses = $\frac{20}{15}$.
Seventeen months later, or June, 1895:
Radius—R. E., vertical meridian, 7.75 mm. L. E., 7.55 mm.
Radius—R. E., horizontal meridian, 7.9 mm. L. E., 7.85 mm.
Retinoscopy now gives R. E. 0.75 D., L. E., 1.75 D. hyperopia.
Vision with same glasses = $\frac{20}{15}$.

This case shows a decided increase in the radius of curvature with a much less amount of hypermetropia. The vision remaining the same.

Case II. Dr. T. F W, whose radius was measured two years ago At that time his refraction was hyperopic, had no astigmatism; radius of curvature of cornea, 8.15 mm. At the present time I find his refraction the same, but now his radius of curvature has increased to 8.45 mm I find no change in his visual power, from this evident flattening of the corneal surface

Case III. Mrs E P J., age 30. Examined Dec., 1895.
Radius—R. E, vertical meridian, 7 65 mm. L E, 7 65 mm.
Radius—R E, horizontal meridian, 7 90 mm. L E., 8.10 mm
R. E., hyperopic astigmatism, 0 50 D ax. 105°
L. E, hyperopic astigmatism 2 25 D. ax. 80°.
Fourteen months after in Feb, 1897:
Radius—R. E, vertical meridian 7 90 mm. L E 7 80 mm.
Radius—R E, horizontal meridian, 8.15 mm. L E., 8.35 mm.
Refractive condition the same as at first examination.

Case IV Mr. J F., age 30. Examined Sept, 1896.
Radius—R. E, vertical meridian, 8.15 mm L. E., 8.25 mm.
Radius—R E., horizontal meridian 8 35 mm. L. E. 8.15 mm.
Seven months after in March 1897:
Radius—R. E, vertical meridian, 8.45 mm. L E, 8.55 mm
Radius—R. E, horizontal meridian, 8.55 mm. L E., 8.40 mm
Retinoscopy showed no astigmatism in R. E., and hypermetropic astigmatism of 1 D. axis 180° in L. E.

These four cases, all show an increase in the length of the radius

of curvature or a flattening of the anterior corneal surface, equal to, at least, a diopter in the refractive condition.

Two more interesting cases are presented in this series, in which the radius of curvature is just the opposite to that of the refractive condition, as in the case of a lady, whose refractive condition and vision under atropin was as follows: $\frac{20}{200}$, w —15 D. sp. ◯ —1 D. cyl. ax. 180° = $\frac{20}{30}+$. Yet, I find the radius of curvature is 7.75 mm. in the vertical meridian, and 8.50 mm. in the horizontal meridian, showing that the myopia was due to the extreme length of the optic axis. In another case, in which the vision = $\frac{20}{100}$, w +0.75 D. sp. ◯+0.50 D. cyl. ax. 180° = $\frac{20}{40}+$. In this case the radius of curvature was only 6.50 mm. in the horizontal meridian, and 6.70 mm. in the vertical meridian.

These two cases show a remarkable difference in the relation between the curvature of the cornea and the refraction and must be due to the length of the optic axis.

To sum up the conclusions, based on these examinations, that seemed to be proved by my table, I would suggest them, as follows:

That the ophthalmometer of Javal will give us other useful information, in reference to the refraction of the eye, than that of simply the amount of astigmatism, as shown by the over-lapping of the mires.

That the radius of curvature bears a certain definite relation to the refractive condition of the eyes, in which, if we find that the radius of curvture is greater than 7.65 mm., that the refraction is probably hypermetropic, as we find only one in ten myopic; on the other hand, if the radius of curvature is less than 7.60 mm., that the refraction is myopic, as now the proportion is found to be one in three.

That in cases of astigmatism "against the rule" it may be due to the curvature of the posterior surface of the cornea and not always to exist in the lens.

That the radius of curvature of the cornea is not always the same throughout life, but that it tends to become greater, showing a gradual flattening of the corneal surface.

And lastly, that this method as described, of examination and recording, will make the ophthalmometer a much more useful instrument in the determination of the refractive condition of the human eye.

ORBITAL PERIOSTITIS—REPORT OF CASE.*

By WM. C. BANE, M. D ,

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Denver, Colo.

ILLUSTRATED.

On Sept. 1st, 1896, I was called by Dr. E. Eckerson to see an infant five weeks old. The babe appeared healthy, and well nourished.

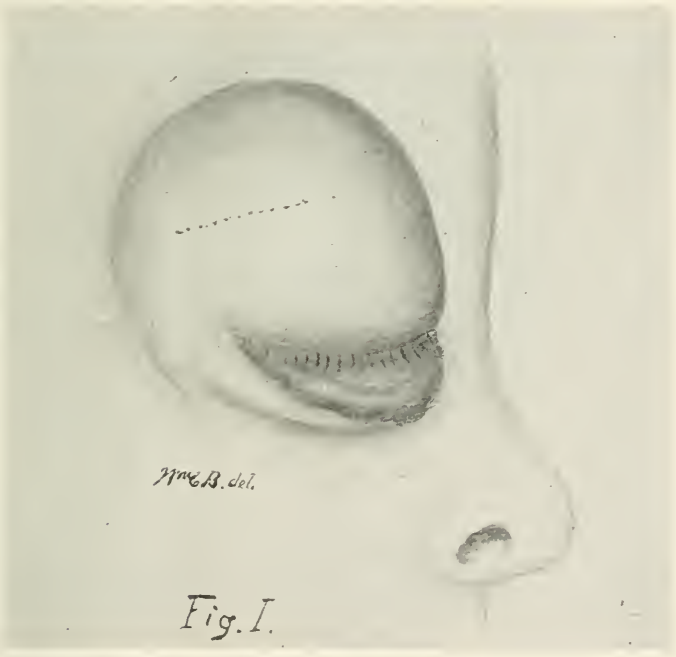

Fig. 1.—Orbital Periostitis in child five weeks old. Dotted line indicates where incision was made.

Parents in good health ; no history of any taint. When three weeks old, a swelling of the right upper eye-lid was noticed by the mother. The swelling increased from day to day, and presented at the end of a fortnight an interesting picture. (Fig. 1).

* Read before the Denver and Arapho Co. Medical Society, March 9th, 1894.

The lid was intensely swollen, of a dark and purplish hue, and firm to the touch. The conjunctiva and cartilage of the upper lid projected downward over the lower lid about 8 mm., was markedly chemotic, and of a dusky color. A view of the eye-ball was not obtainable. At the most prominent point of the swelling of the lid there seemed to be some softening of the deeper tissues I made a free and rather deep incision at this point, through which about an ounce of thick pus was evacuated.

The following day the swelling was very much reduced and upon probing denuded bone was encountered in the upper, outer wall of the orbit, extending fully three-quarters of an inch back of the ridge. The wound was cleansed daily with a 1-2000 solution of formalin, and loosely packed with bichloride gauze.

After eight days the swelling had disappeared, and the eye was found to be normal. A piece of denuded bone could be outlined with the probe, but was as yet attached.

Fig. 2.—Actual size and shape of plate of bone removed thirteenth day after incision was made.

The case was then turned over to Dr. Eckerson, the family physician Five days later, a small plate of bone was removed, after which the wound was allowed to close. Only a linear scar, three-fourths of an inch long, remained at point of incision. No contraction of tissues has taken place, and it is not likely that any will occur, as six months have elapsed since the wound was closed.

Disease of the orbit is rather rare, occurring on an average of once in every 800 cases out of 250,000 eye patients.† Inflammation of the orbit appears as cellulitis, or periostitis. Berry states that "children are especially liable to periostitis of the orbit." The disease is usually found in the lower, outer margin, but in this case it was quite deep, and involved the upper wall.

† Berry on Dis. of the Eye. 2nd ed., page 404.

MALIGNANT GROWTHS OF THE ORBIT, WITH REPORT OF A CASE.

By J. W. BULLARD, M. D.
Of Pawnee City, Nebr.

Dr. C. S. Bull, who has made a careful study of tumors of the orbit, has formulated the following conclusions, concerning malignant tumors in this region.*

1. The prognosis of all forms of malignant orbital tumors, whether primary or secondary, is unfavorable, and if the tumor is primarily in one of the deep facial bones or their sinuses, the diagnosis is positively bad.

2. Except in the case of encapsulated tumors of the orbit, surgical interference is almost invariably followed by a return of the tumor, and the growth of the secondary tumor is more rapid than that of the primary lesion. With each succeeding operation, the period of quiescence in the return of the tumor grows shorter, and the rapidity of the growth increases.

3. The patient's family, and in certain cases the patient himself, should, in the beginning, be told the serious nature of the trouble, and be warned that complete removal of all the diseased germs is a well-nigh hopeless task. The burden of the decision as to surgical interference must rest upon the shoulders of the patient.

4. Repeated operations in these cases undoubtedly shortens the life of the patient. While it is, therefore, our duty to operate in all cases in order to relieve severe and unbearable pain, we should be slow to operate merely for the sake of relieving, temporarily, physical disfigurement or deformity, especially if we are convinced that by so doing we shorten the life of the patient, even if that shortened life is rendered more bearable to him."

In the discussion of Dr. Bull's paper Dr. H. Knapp endorsed the diagnosis except as it related to tumors of the lachrymal gland and optic nerve. He said tumors of the former were not primarily very malignant and may not return for many years.

Long periods may elapse in some forms before a return of the disease, but it has been my experience, and so far as I have been able to ascertain, the experience of all who have to do with these growths, that, unless thoroughly encapsulated, and removed early, they almost without exception, return sooner or later.

*New York Medical Journal, Aug 29, '96.

Bearing on this subject, I wish to report the following case, which I think of more than ordinary interest:

J. F., age 36, married and of good family and personal history, the very picture of health, and weighing about 180 lbs., consulted me on Aug. 10, 1890, for diplopia, which he first noticed during the previous winter. There were slight exophthalmus of the left ball, which was crowded downward and inward, some ptosis, and external rotation was restricted. V. O. D. = $\frac{20}{20}$. V. O. S. = $\frac{20}{50}$, improved with a +0.75 D. sp. to $\frac{20}{30}$. Fundi normal. Palpation revealed a firm tumor well under the orbital arch, which appeared to involve the lachrymal gland. The patient was put on increasing doses of pot. iodide, following which there was an appreciable improvement in both subjective and objective symptoms.

After a month or so patient was lost sight of till the first of July, 1891, when he presented himself again. The tumor had materially increased in size, and was then projecting beyond the border of the orbit, and the ball was considerably displaced. The growth could be mapped out from the supraorbital notch around to one cm. below the external canthus.

The patient was apprised of the pros and cons of operation, and chose to have the growth removed, which was accordingly done on the 9th of July, under chloroform. The tumor was exposed by a curved incision just beneath the margin of the orbit, extending from the supraorbital notch to the external canthus. It proved to be an encapsulated and lobulated tumor of the lachrymal gland. It was very easily separated from the sheaths of the ocular muscles and the anterior part of the roof of the orbit ; it extended, however, to the apex, and was quite firmly adherent above, where it was necessary to use the enucleation scissors. The incision was closed and a compress bandage applied. The wound soon healed, the ball returned to its normal position and full acuity of vision was restored. A microscopic examination showed it to be an adeno-sarcoma of the lachrymal gland.

In the spring of 1892 the disease recurred, and the patient was informed that it would be necessary to sacrifice the ball that the orbit might be eviscerated, as that promised the only, though somewhat forlorn, hope of relief. Drs. H. Gifford and D. C. Bryant, of Omaha, each saw the case with me at this time and concurred in this opinion. Accordingly on the 17th of May '92, the patient was again anesthetized with chloroform, the eye enucleated, the growth removed, and the contents of the orbit thoroughly eviscerated, except the periosteum from the floor which did not seem to be involved in the least. The orbital plate of the frontal bone, which was affected, was thoroughly scraped with a Volkmann sharp curette.

Early in September there were signs of a relapse, and by November the growth had filled the orbit and begun to crowd out the lids The patient wished me to make one more effort, which I did on the 16th day of November, Every vestige of periosteum was removed from the orbit even going into the sphenoidal and spheno-maxillary fissures. The superior border of the orbit was chiseled away and the roof scraped as thin as possible without exposing the brain,

The next spring, '93, there was a return of the tumor, which gradually enlarged until at the time of his death it covered the entire left side of his face and grew down through the antrum and filled the roof of his mouth.

I did not see him after the summer of '93, but a recent letter from his widow informed me of the later condition. The tumor broke down

at one point and discharged pus for a few days about ten months before his death, and then healed and remained a solid tumor until the end, which occurred on the 2nd day of August, 1895, over five years from the time he first consulted me.

Whether this man's life was prolonged or shortened by the operations, I am not prepared to say, but he lived five and one-half years after the growth began to interfere with the proper movements of the eyeball.

These cases progress very rapidly sometimes, as did case No. 2 of Dr. J. A. White's series.*

In May, 1895, Dr. Casey A. Wood, of Chicago, eviscerated the orbit for sarcoma in a boy 13 years of age. In July of the same year he came into my hands, and the growth having returned was protruding from the roof of the orbit and crowding out the upper lid. The boy died on the 13th day of August following from pernicious anemia, whether as a result of the sarcoma or not I am not able to say.

In this case (I quote Dr. Wood) "the tumor was an ordinary example of compact, non-pigmented sarcoma with flattened cellular elements.

TWO CASES OF MARKED AND RAPID CHANGE IN REFRACTION IN PATIENTS SUFFERING FROM GLYCOSURIA ASSOCIATED WITH VARIATION IN THE AMOUNT OF SUGAR SECRETED IN THE URINE.†

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The following cases of saccharine diabetes exhibiting remarkable changes in the refraction of the eyes, associated with variation in the amount of sugar excreted with the urine, seem to the writer of sufficient interest to place upon record in the annals of the society:

Mrs. S., aged 49, was sent to me by her physician, Dr. Ward, in November, 1882. She was the subject of glycosuria, but her physician reported that under treatment by the nitrate of uranium the sugar, which had been very abundant, the specific gravity of the urine rising at times to 1050, had entirely disappeared. She no longer suffered from thirst and the general health had greatly improved. She complained, however, that with the improvement in her general condition her

* *Journal A. M. Association*, vol. 19, No. 16, page 460.

† Read before Am. Oph. Society at Washington, D. C., May 5th, 1897.

vision had grown rapidly worse, so that she was not able to read or see distant objects clearly with her glasses, +2.75 D., although she had experienced no difficulty in this respect until within a few days. With her glasses, V., O. D. $= \frac{1}{5}$, O. S. $= \frac{1}{4}$, and there was no range of accommodation. The optic nerves were very red, and the margins veiled, but no hemorrhages or splotches were present in the eye ground. The lenses were slightly opalescent and the nucleus was plainly outlined in both, but there were no spicules of opacity or stria. The tension was normal, and the cornea transparent. A mydriatic was instilled, and after careful examination she received for O. D. +5 D. ⊃ +1.25 cy. ax. 75°, V. $= \frac{6}{vi}$. O. S. +6 D. ⊃ +.75 cy. ax. 105°, V. $= \frac{6}{vi}$.

Ten days later the glycosuria had returned and she complained once more of dim vision with her glasses, which were then reduced to +3 and 3 50 D. respectively, with cylinders as before, which gave her $\frac{}{vi}$ in each eye. Accommodation was still absent. On the 31st of October, fifteen days later, the refraction had once more increased until she chose for O D +1.25 D, ⊃ +1.25 cy. ax 75°, V $= \frac{6}{vi}$. O. S. +1.50 D. ⊃ +.75 cy. ax. 105°, V. $= \frac{6}{vi}$. The anterior chambers were shallow, the lenses strongly reflecting but no opacity present. She remained under observation for several months with no further notable change in the ocular conditions, but her general health failed rapidly under the persistent glycosuria and the attending nutritional changes.

Case II. Mr. W. C. S., aged 74. Has been suffering for at least six years from saccharine diabetes, under the professional care of Dr. James C. Wilson, of Philadelphia. During that time the sp. gr of the urine has rarely fallen below 1020 and rarely risen above 1030. His treatment had been carefully conducted, and strictly carried out by an intelligent and loyal patient

The condition of his eyes in August, 1896, was as follows: The refraction error was corrected by O D. +1.50 ⊃ +1.25 cy. ax 180°, V. $= \frac{6}{vi\frac{1}{2}}$. O. D. +1.25 ⊃ +1.25 cy ax. 180°, V. $= \frac{6}{x}$.

The anterior chamber was shallow in each eye, and through the narrow pupil the eye ground could be seen with difficulty, and all details were veiled. The pupils dilated small medium only with homatropin, but sufficient to reveal spicules of opacity in the lower half of both lenses, more advanced in the left eye The nucleus was here plainly outlined, and with oblique light the lens seemed opalescent with plainly differentiated sectors. The eye ground was very fluffy in appearance, with gray white splotches here and there through the fundus, and a large semi-atrophic crescent or conus embracing the lower temporal border of the optic nerves. These conditions were present in both eyes, but more advanced in O.S., and remained with but little variation until April 9th, 1897, the vision being on that date recorded as O D $\frac{6}{vii\frac{1}{2}}$. O. S. ^{6}. *On April 23rd* he complained of dim vision for distant objects and inability to read even large type with his reading glasses. V. $= {}^{6}$ in each eye with his distant glasses. He expressed his surprise over his failing vision in view of the fact that he was much better in all other respects. Dr. Wilson reported the sp. gr. of the urine as having fallen from an average of 1026 to 1012, on one occasion being as low as 1006, and no sugar, or but a trace present

He now selected O. D +2.50 ⊃ +1 25 cy. ax. 180°, V. $= \frac{6}{vii\frac{1}{2}}$ O S +2 ⊃ +1,25 cy. ax. 180°, V. $= \frac{6}{ix}$. There was no notable change in the fundus or lens of either eye.

On May 20th, 1897, Mr. S returned saying he had been compelled to return to his old glasses within a few days, as the new ones blurred his distant vision, and that the reading glasses compelled him to hold his book too close to the face He now selected his old glass with each eye, with which O. D. V $\frac{6}{vii}$¼, O. S. V. $\frac{6}{xx}$. There was a slightly diminished acuity of vision in each and in O S. the lens was swollen and distinctly more opalescent. The specific gravity of the urine was 1027 and it contained 4.20 per cent. of sugar.

The probable cause for the rapid change in the refraction of the dioptric system of the eye in these two cases furnishes a most interesting inquiry, any answer to which, however, must be purely hypothetical. It is highly probable that the unstable equilibrium of the transparent component cells of the crystalline lens would be readily disturbed by qualitative change in its environing fluids, especially any change from the normal relative density or specific gravity of the tissue of the lens and the nutritive fluids in which it is bathed. It is well known, for example, that the entrance into the tissues of the frog of rapidly diffusible substances, as chloride of sodium, naphthalin and sugar impair the transparency of the lens, presumably because of some such changes as suggested above in the osmotic qualities of the fluids in and around the lens. These considerations render it at least probable that in the cases here recorded the change in the density of the tissue fluids suggested by the varying amounts of sugar secreted with the urine, was sufficient to disturb the physiological relation of osmosis in the lens and by this means to cause the observed changes in the refraction of the eye.

VICARIOUS HEMORRHAGES INTO THE EYES AT THE MENSTUAL PERIODS.—REPORT OF A CASE.

By A. EDWARD DAVIS, A. M., M. D.,

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Lena B—,a young married woman, aged 22 years, came to the clinic of Drs. Lewis and Van Fleet, at the Manhattan Eye and Ear Hospital on January 12th, 1897, and was assigned to me for examination and treatment.

History.—One year ago the right eye became suddenly inflamed and the sight very much impaired. This inflammation was mild in character, lasted but about one week and got well of itself without any treatment. The sight in the eye returned to some extent, and now by the aid of glasses is very good.

One week ago she awoke with the sight gone from the left eye, just as it had gone from the right eye, though it was perfect on going to bed the night before. She noticed the change in the eye more particularly, because the sight was so poor in the right eye, and because she depended on the left eye almost altogether for her work.

No specific or rheumatic history could be elicited after a searching inquiry, and the condition of the patient certainly shows no trace of either. Although the patient is 22 years of age she never menstruated until she was 21 years old, the flow lasting but about 24 hours, being very scanty and often not necessitating the use of a napkin. She has never had any painful menstruation and has always been regular. For the last 12 months the patient has complained of sleepiness at times, but she has never been seriously ill and has never been injured.

The patient's father died at the age of 35, when she was a small child, and she does not know of what disease; her mother is living, aged 5 › years, and in good health. She has 5 sisters, one older and the others younger than herself, all healthy and with good sight.

The sudden loss of sight in the right eye, afterwards partially restored (vision now in that eye is $\frac{20}{200}$, brought up to $\frac{20}{30}$ths with a proper glass) occurred just two days before the establishment of the menstrual periods; and the sudden impairment of sight in the left eye took place about one year later, just one day after the menstrual flow.

Condition.—Her general health is first-class. She weighs now 135 pounds, although when 16 years old she weighed 160 pounds. Her flesh is firm, not flabby, and she has not lost but rather gained in strength since she has not been so stout. She eats well, has no cough, and on examination of her chest by Dr. Bowles shows her to have sound lungs and no heart lesion of any kind.

Dr. William H. Haskin made a vaginal examination and reports a retroversion, but the womb is perfectly movable, the os uteri patulous and offering no obstruction to the menstrual flow. Dr. Haskin also examined the blood of the patient and found it rich in haemoglobin — 90 per cent. — and in red corpuscles; so there is no pernicious aenemia in the case.

The urine has been examined repeatedly, especially for sugar, but none has been detected. The specific gravity, 1008, is rather low, but no trace of albumen been found at any time. The quantity of urine passed in 24 hours is normal, about 50 ounces; and there is no diminution of urates which might cause an increase of blood tension; nor is there any indication of oxularia.

There is no history of epistaxis, but the patient suffers from constipation.

Eye Conditions.—Right Eye,—the ophthalmometer shows a large amount of corneal astigmatism. Vision $\frac{20}{200}$; $\frac{20}{30}$ with a — 0.50 D. sp. ⊃ —3.50 D. cylinder, axis 60°. The pupil is irregular, partly occluded at the periphery, and there are posterior synechiae. Under the use of atropine—solution 4 grains to the ounce—instilled every five minutes for 40 minutes, the synechiae yielded above, but a firm adhesion remained between the lens and the iris below. The ophthalmoscope showed the fundus of the right eye to be normal.

Left Eye,—the ophthalmometer showed but 0.50 D. astigmatism. Vision $\frac{4}{200}$, not improved. The pupil is about $\frac{2}{3}$ dilated, but reacts slightly when light is thrown into either eye, more markedly, however, when the light is thrown into

the right eye—consensual reaction. The tension is normal; no pain. In fact she has never had pain in either eye, but has complained of a heavy feeling in the forehead at times.

The ophthalmoscope shows a hazy fundus, but with a red reflex all over it. This diffuse haziness is so marked that the disc and retinal vessels cannot be made out. However, with a plus 2 D. glass in the ophthalmoscope, a triangular white spot, about $\frac{1}{3}$ the size of the disc, can be seen just at the outer side and below the disc, about 4 millimeters from it. In the center of this triangular white spot is a small red spot, and extending from this red spot, directly forward, and slightly upward, is a baloon or cone-shaped membrane, the apex of the cone attached to the red spot and the membrane extending forward into the vitreous. This cone-shaped membrane could be traced distinctly by gradually increasing the strength of the plus glasses in the ophthalmoscope, till the base of the cone could be best seen with a plus 8 diopter glass. The diffuse haziness of the fundus indicated that the coloring matter of the blood from the hemorrhage had become dissolved into the vitreous.

Treatment and Progress of the Case.—A cathartic was prescribed to begin with, and, not knowing what else to do, the patient was placed on the mixed treatment of mercury and potassium iodide, though no specific history could be obtained.

At the end of one week the pupil had contracted down to almost its normal size and the vision had improved from $\frac{4}{200}$ths to $\frac{8}{200}$ths. The haziness of the fundus changed but little however.

On Feb. 8th, about one month after first observing her, the pupil had resumed its normal size and action, the haziness of the fundus cleared considerably, but not sufficient for a view of the disc or blood vessels. Vision had increased $\frac{10}{200}$ths. On this date I presented her to the New York Ophthalmological Society. In the discussion which followed, it was suggested that *retinitis proliferans* might follow the hemorrhage, as this rare condition sometimes follows hemorrhage into the vitreous.

March 3rd about two months since the hemorrhage, the vision has improved to $\frac{20}{100}$ths; the fundus is sufficiently clear to get a faint outline of the disc and the large retinal vessels, and to show that the hemorrhage is from the choroidal vessels. The membrane is thinner than at first, but still persists. No blood vessels can be traced on to it.

Etiology, Prognosis and Treatment. Etiology.—In reporting this case of vicarious, or as some would prefer to call it idiopathic, hemorrhage into the eyes of this young woman, I am not unmindful that hemorrhages of a like character also occur in the eyes of the opposite sex, especially at puberty and up to 25 years of age. However, these idiopathic hemorrhages into the vitreous are very rare. Nieden observed it only nine times in 35,000 cases between the ages of 15 and 24 years. The etiology of recurrent, spontaneous hemorrhages into the eyes of young adults—excluding, of course highly myopic and diseased eyes—remain obscure. The very term *idiopathic* hemorr-

hage which is applied to this condition by most writers, is a confession of uncertainty of cause.

Nieden*, in a paper on this subject read at Heidelberg in 1882, says its cause cannot be traced, and especially excludes albuminuria, diabetes, syphilis, gout, haemophilia, &c, as factors in its etiology.

Eales† considers the condition due to a neurois. He says—"From the character of the hemorrhage, and from the evidence of local variations of circulation,and from the slow pulse,constipation, flushing of the face, headache, and puffiness and discoloration of the eyes, I am inclined to attribute this combination of conditions to a neurosis affecting both the circulatory organs and the digestive system, leading on the one hand to partial inhibition of the muscular movements of the bowels, and to vasomotor contraction of the vessels of the alimentary canal, with inhibition of its secretory functions, thereby causing dyspepsia, constipation and malnutrition; and on the other hand to a compensatory dilatation of the systemic capillaries, especially those of the head, and in these cases of the retina causing over distension of the venous system and systemic capillaries, with liability to rupture on the occurrence of any identifying cause."

Zieminski‡ is of the opinion that hypertrophy of the heart may have something to do with it, but he thinks the real cause is due to auto-infection from retention of decomposed faeces. Or, if we put his words into the language of to-day, we would say *ptomaine* poisoning.

The fact that most of the cases that have been reported have been obstinately constipated would seem to lend some color to his theory.

Spalding, ‖ in an exhaustive and ably written article on this subject, in 1892, gives three factors as exciting causes, viz. (1) to violent exercise, (2) suppression of habitual discharges—menses, epistaxis, bleeding hemorrhoids, etc.—(3) over-work of the eyes.

That menstruation, particularly abnormal menstruation affects the eyes at times cannot be doubted, judging from the number of well observed cases reported in literature.

The cases of recurrent herpetic eruption on the cornea, regularly at the menstrual period, reported by Landesburg § and Ransohoff [a] are classical. And Mueler,[b] in 1893, reports the case of a woman who

* Reviewed in *Archives Ophthal.*, Vol. II, page 432.
† Quoted in Berry's Text-Book, *Diseases of the Eye*, page 319.
‡ *Record d' ophtal.*, 1888
‖ *Arch Ophthal*, Vol. 21, pages 220-30.
§ Hirschberg's *Centrabl.*, 1883.
a Zehender's *Monastbl.*, 1889.
b " " 1893

had menstruated regularly from her 15th year, and who from her 24th year had a recurrent conjunctivitis with marked chemosis at each menstrual period, until she married and became pregnant. During three pregnancies the conjunctivitis ceased, to recur between times. This case was so well marked and closely connected with the menstrual periods that Mueler called it *Chemosis Menstrualis.*

Friedenwald,* in a recent paper on—Affections of the Eye and Normal Menstruation—reports two cases of superficial punctate keratitis, one case of conjunctivitis, one case of iritis,and two cases of hemorrhages into the vitreous, which recurred regularly at the menstrual periods for a number of months. The cases of iritis and vitreous hemorrhages, however, occurred in previously diseased eyes. His opinion was—"that menstruation acted only as an exciting cause through the increased pressure of the general vascular system."

In the case reported by me, I am of the opinion that the hemorrhage into each eye was due to the general increased blood-pressure in all of the vessels, from the almost complete suppression of the menses, and perhaps partly from constipation.

Treatment.—Graefe was of the opinion that these cases did just as well without any treatment whatever as under the best of treatment.

Nieden advised mercurials and iodide of potassium. Spalding strongly advised the hypodermic injections of muriate of pilocarpine, $\frac{1}{12}$th gr. once a day, Heuteloup's leech to the temple, and constant current.

I may say that I consider the natural leech just as good as the artificial one of Heuteloup. The alimentary canal in these cases should be carefully looked after and a general hygienic *regime* carried out.

Prognosis.—On the whole proghosis is good. Unless the hemorrhage recur too often the vision remains fairly good—sufficient for practical purposes.

* *Journal of Eye, Ear and Throat Diseases*—(Baltimore)—October 1896.

A CASE OF UNRECOGNIZED EMPYEMA OF THE RIGHT SPHENOIDAL SINUS; GREAT EXOPHTHALMUS AND DIVERGENCE OF RIGHT EYEBALL; EXTENSIVE EDEMA OF RIGHT SIDE OF FACE AND NECK. DEATH. AUTOPSY.

By D. W. GREENE. M. D.,

Of Dayton, Ohio.

Oculist and Aurist to National Military Home, to Deaconess Hospital (Protestant), to St. Elizabeth Hospital (Catholic).

ILLUSTRATED.

Tke subject of diseases of the accessory cavities of the nose is attracting a good deal of attention at this time. The October, 1896, number of the *Archives of Ophthalmology* contained a very interesting and instructive paper by C. R. Holmes, of Cincinnati, in which the anatomy of this region is thoroughly gone over, and several apparent errors in relation to the topography of the region as given by Gray and others are pointed out. He also gives histories and symptoms of two very interesting cases of sphenoidal disease, one he diagnosed during life and operated upon through the nose, as proposed by Zuckerkandl, the patient recovering and vision which had been lost, partially returning. The character of the other case was not recognized during life.

Dr. Henry Gradle's paper and its discussion before the Chicago Academy of Medicine, printed in the *Journal of the American Medical Association*, December 19th and 26th of last year, have given new interest to the study of disease in these cavities. As long ago as 1863 Horner of Berlin reported a case of a girl 15 years old who became blind, had exophthalmus and immobility of the right eye, with slight swelling of the head of the optic nerve, and who died a few months later of meningitis. A post mortem examination revealed a condition so nearly analogous to the case I shall report, that it need not be given here. Particular attention might be called to the statistics given in Dr. Gradle's paper bearing on the frequency of sinus disease, as reported by Fraenkel, Wolff and Harke.

Fraenkel reported about one year ago that he had made 146 autopsies on unselected cadavers in the dead house at Hamburg. In no single case had a diagnosis of disease of the sinuses been made during life, yet he found disease in one or more of the sinuses 63 times, or in about 40 per cent.

Wolff has reported the autopsies of 22 children who had died of diphtheria in every instance of which, the maxillary sinus was diseased. In 15 the sphenoidal sinuses were not developed; in the other 7, in which these sinuses were developed, they were invariably found diseased.

Harke made 30 autopsies on as many children dead of acute infectious diseases and found one or more of the sinuses affected in every case, and of 37 adults examined post mortem, dead of acute infectious diseases, he found sinus involvment 31 times.

The frequency with which the different cavities are involved seems to be about as follows: First the maxillary, second the frontal, third the ethmoid and fourth the sphenoid. As to the order of frequency of disease of the first two there can be no question, but there may be some doubt as to the relative frequency with which the last two cavities are affected. That diseased conditions of the accessory cavities are very common and not very dangerous to life, the statistics just quoted abundantly prove. Still a sufficient number of cases (probably 25 in all) have been recorded in which death was clearly due to extension of inflammation from the ethmoidal cells or sphenoid sinuses to the meninges, to the brain itself or to the large venous channels at its base, causing thrombosis and septicaemia.

The following case is recorded in the hope that it may be helpful in further elucidating the obscure signs and symptoms of this disease:

Henry Sensenbaugh, age about 29 years, farmer living near Gordon, Ohio, had obstruction of nasal cavity whenever he took cold; took stock to market on Thursday, December 3rd, 1896. Complained of pain in his head, which was worse when he reached home in the evening; had complained of headache for several weeks; located pain deep in the head back of the eyes. Went to bed Friday Dec. 4th, complaining of increased headache and terrible aching throughout his body. He was seen the next day, Saturday, Dec. 5th, at 10 a. m., by Dr. W. H. Kiester, who has kindly furnished me the following history:

"My first visit to Sensenbaugh was at 10 a. m. Saturday, Dec. 5th. His symptoms were slight cough, small amount of expectoration (character not stated), temperature 101½, pulse 90, respiration 24 complained of great frontal headache and pain behind his eyes and he was constantly blowing his nose. My second visit was at 5 p. m. Sunday, Dec. 6th. His wife said he had passed a very bad night and had been restless all day. Pain was so severe that he had to have morphine every three or four hours. His right eye began to pain him severely Saturday night; this continued all day Sunday and at the time of my visit the eyeball was bulging out, was divergent and he said he could not see anything with it. Temperature 104¾, pulse 88, respiration 26. Noticed some fullness of the right side of the face and neck; he was perfectly conscious, sat up in bed, had good use of speech and of his extremities and said

pain was not so great now since he had taken so many resting powders (morphine). My third visit was on Monday, Dec. 7th, 9 a. m. Found general condition of patient anything but encouraging Temperature 99½ pulse 82, respiration 28, some discharge from the right nostril tinged with blood. The eye was still prominent at this time. I learned that it had been painful all the night before, especially so from 2 to 4 a. m., when he became unconscious and remained so until death at 1:15 p. m. Vomiting was a frequent symptom after taking food "

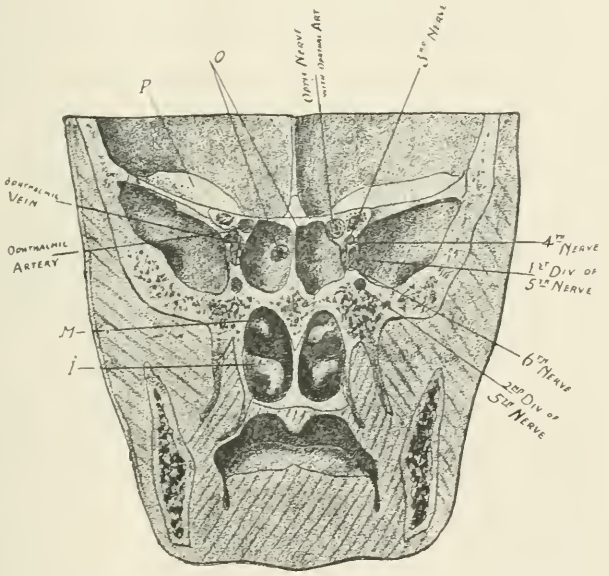
I was called to see this case on account of his eye symptoms, but it being too late for the early train I did not reach his residence until 1:30 p. m. He had been dead about fifteen minutes when I arrived. The appearance of the face and neck was unnatural and striking, and the exophthalmus of right eyeball was the greatest I have ever seen, the divergence being also marked. On account of the dry and wrinkled condition of the cornea an ophthalmoscopic examination was not possible. The left eye however was still clear. In this eye there was no papillitis, no retinal hemorrhages; the veins were large and tortuous and the arteries empty like mere threads.

The train of symptoms of which I learned, the rapid dissolution and the unnatural appearance of the eye, side of face and neck, all pointed to an obstruction of the venous circulation at the base of the brain, the extent, location and cause of which nothing but an autopsy could reveal. We readily obtained consent to have one made, and Dr. Ellis of Dayton, formerly first assistant surgeon and pathologist at National Military Home, was telegraphed. I append his findings:

AUTOPSY UPON BODY OF HENRY S.

On the night of Dec. 7th, 1896, at the request of Dr. D. W. Greene of Dayton, Dr. W. H. Kiester of Arcanum and others, I made an autopsy upon the body of one Henry S., a farmer near Gordon, Ohio. The body was that of a male, about 29 years of age, 5 feet 9 inches in height, well developed and nourished. P. M. rigidity pronounced. P. M. staining slight. Body was warm; autopsy seven hours after death. Contents of chest and abdomen not examined. No external evidence of recent or past disease or injury except about the head. The head and face presented a peculiar and striking appearance. There was marked oedematous swelling of the tissues of the right cheek running up over the right side of the forehead backward to the ear and downward over the neck almost to the clavicle. A muco-sanguinolent discharge oozed from the right nostril, and the right eye, boggy and bloodshot, bulged from its socket forward between the swollen lids at least half an inch. Its axis was divergent and it

could be reduced only slightly by pressure. There was no sign of fractured bone, emphysema or inflammation here. On the left side of the face there was slight oedema of the eye-lids, but no congestion of conjunctiva or exophthalmus. The pupils of the two eyes were equal in size, moderately dilated and regular. No discharge from either ear and none from mouth, except frothy stomach contents. On removing the calvarium a large amount of clear serum escaped, decidedly in excess of the usual quantity. The brain itself was apparently normal, except for slight excess of cerebro-spinal fluid in the ventricles and general oedema. The meninges were markedly oedematous. On



Frozen section of anterior half of head, cut immediately in front of chiasm. *P.* Orbital roof of frontal sinus. *O.* Ostium sphenoidale. *V. V.* Right and left sphenoidal cavities. *I. M.* Inferior and middle turbinates.

removing the brain a very interesting picture was disclosed. The blood vessels, veins in particular, occupying the floor of the right anterior and middle cerebral fossae were engorged with blood; the overlying dura was boggy and opaque and the anterior clinoid processes, together with the superior wall, or roof, of the right sphenoidal antrum were of a greyish red color, almost black in places, and necrotic. The right ophthalmic vein and artery, the right optic nerve and other minor

structures occupying this position about the right clinoid process, were agglutinated and embedded in a mass of inflammatory lymph. On chiseling through the orbital plate of the frontal bone the cellular tissue, muscles, nerves, etc., lying in the orbit behind the globe were infiltrated with lymph and swollen.

Cause of death: Abscess of sphenoid cavity.

Immediate cause of death: Oedema of brain.

S. Blackburn Ellis,
Dayton, Ohio.

Reference to the accompanying plate, which Dr. C. R. Holmes has kindly permitted me to use, will aid in explaining the symptoms in this case. His interpretation of the symptoms in one of his own cases, which was almost identical with my own, I quote:

"First: Dull pain inside of head at intervals for a year or more, aggravated by cold.

"Due to inflammation in sphenoidal cavity, with retention of pus when ostium sphenoidale was closed by the swelling of the mucous membrane and swollen turbinated bodies.

"Second: Neuralgia of first division of fifth nerve, gradually becoming intense and constant.

"Cause: Extension of inflammation through thin bony walls of sphenoidal cavity into the sphenoidal fissure, causing first irritation, then pressure, on the fifth nerve.

"Third: Visual disturbance slowly increasing to total blindness.

"Cause: Inflammation extending from sphenoidal cavity through bone of "paper thickness" to optic nerve. Reduction of calibre of ophthalmic artery for same reason.

"Fourth: Exophthalmus and congestion. Caused by inflammation in sphenoidal fissure and strangulation of ophthalmic vein."

In addition to these I would explain the oedema of the eyelids and face in my case upon the same principles that Dr. Holmes suggests in the case of exophthalmus and congestion, that is, obstruction to the return of blood through the ophthalmic vein, combined however with a general inflammatory process in the orbit as found at the autopsy.

SOME CAUSATIVE FACTORS IN ULCERATIONS OF THE CORNEA.

By FRANK H EDSALL, M. D ,

Ophthalmic Surgeon to St. Francis Hospital and to the Pittsburg Hospital for Children.

In the treatment of corneal ulcerations there has been, in the experience of the writer, in certain of these affections, much to be desired from the standpoint of rapid results, and it was in the belief that there were causative factors not generally recognized and to the neglect of which were to be attributed, in a large measure, the unsatisfactory results from treatment that he has been led to submit this brief consideration of two points in the etiology of the affection which are, seemingly, often unrecognized or disregarded.

Every ophthalmologist has brought to him, not rarely, young children with eyes swathed in bandages and otherwise guarded, whose dread of light is so acute that the mere attempt to remove the coverings is productive of a struggle which, once they are removed, becomes so desperate, in the effort to protect the eyes from the light, that a satisfactory examination without anesthesia is almost impossible. When once the lids have been separated and the eyes examined carefully it will be seen that the inflammatory symptoms are, usually, not especially pronounced in degree. There is, usually, some injection of the subconjunctival vessels and profuse lachrymation and, somewhere on the cornea, there will be found a spot of ulceration, generally, I think, very small in extent and rather superficial in character. As a rule, there is little tendency for this ulcer to increase in size, but there is, likewise, very little tendency towards healing. I have, in times past, exhausted, as I thought, all possible solutions of the etiological riddle in these cases without finding anything that offered a foundation upon which to base treatment which subsequent trial has proven satisfactory. These cases are most frequently found among rather poorly nourished children or among children who have been given too much latitude in their eating and are, as a consequence, affected with digestive disturbances, but it has been my experience that the strictest attention to diet, to hygiene, to the state of the digestion or to the use of alteratives or tonics, combined with the most approved course of treatment local to the eyes, will not suffice to bring about a cure of the trouble within a reasonable space of time.

My attention having been drawn to the fact that almost or quite all of these cases have an irritating discharge from the nostrils which

produces an eczematous condition of the skin about the nose, I was led to believe it possible that the condition of the nasal mucous membrane might be the causative factor in the case and, acting upon this thought, I determined to direct my attention in such cases, chiefly, to the treatment of the intra-nasal trouble. The results from this treatment have been most satisfactory. Cases of this character which had, heretofore, resisted such means of treatment as I had at command have promptly yielded to the relief of the nasal trouble, combined, of course, with the usual methods used in the treatment of the eye affection and in several instances, where I had been successful, for the time, in relieving the ocular trouble but had been bothered by repetitions of the attack I have been able to do away with the tendency towards a relapse. I do not know that this idea is at all new, but I may say that I have never, that I can recall, seen more than the most casual mention made of it in any work on ophthalmology and the subject of the relationship between inflammatory conditions of the nasal mucous membrane and this form of ocular trouble is, apparently, quite generally ignored, although it is, I am convinced, a more satisfactory explanation of the occurrence of many ulcerations of the cornea than the attention which is given to it would indicate.

Just what treatment should be adopted for the nasal trouble I need scarcely consider here. For my own use I prefer an alkaline spray with Listerine, or some similar preparation, followed by the application of nitrate of silver in such strength as may seem appropriate. I believe that the ocular trouble is undoubtedly of bacterial origin with the infection propagated from the nasal cavity, and my chief aim is to keep the nasal cavities as sterile as may be and to reduce the inflammatory state of the mucous membrane as rapidly as possible.

To illustrate the difference in results between cases treated without attention to the condition of the nasal mucous membrane and those in which attention was given in this structure I shall briefly mention two cases in which both methods were used.

The first was that of the six year old daughter of a promising glass manufacturer of this city. A too liberal indulgence in sweets and other indigestible food had impaired her nutrition, but this impairment was not sufficient to altogether explain the eye affection, a corneal ulcer quite typical of the variety I have mentioned. At intervals, for over a year she was under treatment with, in general, such unsatisfactory results that I was becoming thoroughly disgusted with the case. Everything that I had ever used for this condition and everything that seemed of value to use was tried with unsatisfactory results. In despair almost, I determined to subject her to a thorough course of treatment for the rhinitis with

which she was affected, hoping to get some improvement from this. The results were surprising. In less than a month the ulcer had entirely cicatrized and up to the present time, over three years, there has been no return of the trouble. The only variation from the previous treatment used in the case was in the direction of relief to the nasal mucous membrane.

In this case I had, myself, for a long time overlooked the possible relationship between the ocular affection and the intra-nasal trouble. In the case which follows a much older practitioner than I erred in the same way and it was, I am convinced, due to the lesson I had learned from the other case that I was able to relieve this case so promptly.

The case was that of the three year old adopted daughter of a newspaper man of this city. She was a very self-willed spoiled child for whom it was almost impossible to do anything because of her struggles and the dread of her foster parents lest she should be hurt. Previous to coming into my care she had been, for six weeks, in the hands of one of the oldest specialists in diseases of the eye in the city with, as the parents said, no improvement in her condition. Examination of the eyes demonstrated the presence of a minute ulcer of the cornea at the nasal margin of the pupil of the right eye ; pronounced injection of the subconjunctival vessels was also noticed and, in addition, there was profuse lachrymation and intense dread of light. The skin about the nose was excoriated by the discharge from the nostrils which, the parents informed me, had been present from the inception of the eye trouble. The little patient had had the benefit of the usual line of treatment for such cases without relief to the eye, and as there had been no treatment directed toward the nasal trouble, I considered it advisable to give chief attention to this condition, although I did not, of course, neglect the necessary local treatment for the eye. Coincident with the improvement in the rhinitis there was a lessening in the eye trouble. The injection diminished the ulcer began to fill up and the photophobia disappeared with a rapidity that was remarkable. In less than two weeks instead of the child who had shrieked in terror at the mere suggestion of exposing her eyes to light she walked into my office with no protection to her eyes other than a moderately tinted pair of glasses, and even these she would remove without hesitation.

I can see no reason to doubt that the good results in both these cases were due, chiefly, to the relief of the nasal affection. Both of them were cases that had baffled all treatment till attention was given to the rhinitis when they promptly recovered, and in neither of them has there been subsequent trouble.

I might materially lengthen the list of cases thus treated without adding emphasis to the lesson taught by these two. I will therefore turn from this phase of my subject, merely remarking in passing that I make it a routine practice now when I find any nasal trouble present in a case of corneal ulcer which I have to treat to always give as much attention to that as to the condition present in the eye.

Another point often overlooked in determining the causation of

corneal ulcer, yet not to the same extent as the one just mentioned, I think, is the relationship between this condition and errors of refraction. The refractive defect most prone, I think, to cause disturbance in the nutrition of the cornea is a myopic astigmatism, although I have seen the cornea involved in an inflammatory affection arising from excessive demand upon the ciliary muscle dependent upon almost any of the various refractive errors. The mechanism of its production is, doubtless, identical with that of inflammations in other portions of the eye due to the same cause—interference with the trophic influence of the nervous system upon the nutrition in consequence of over-stimulation of the nerve supply to that part and to circulation disturbance. There is no special characteristic of this form of corneal trouble to distinguish it from other corneal ulcerations, beyond its tendency to recur, that I have been able to observe. All forms of corneal ulcers, however, demand close inquiry into the refractive state of the affected eye, and if this point be attended to this causative factor will not be overlooked.

I might cite numerous cases illustrative of the bearing which a refraction error may have upon a corneal ulcer, but the one which follows is so typical that it will suffice.

Mr. F., an official in a large manufacturing concern, consulted me for an ulceration of the cornea for the right eye. The ulcer was crescentic in form at the nasal margin of the cornea. The usual symptoms of the affection were present, and the only noteworthy point in the course of the disease was the little tendency it exhibited to yield to anything less active in the way of treatment than the galvano-cautery. Within a period of some six months the patient had three attacks of this form of ulceration, twice in the right eye and once in the left. I had suggested the advisability of obtaining glasses early in my experience with him, but he had demurred, partly because he did not care to wear glasses and partly because, after the loss of time caused by the ulcerations, he did not wish to remain away from business long enough to use a mydriatic Following the third attack, however, I insisted upon this proceedure and he finally consented. I found a myopic astigmatism of 0.75 D. slightly off the horizontal meridian in both eyes and prescribed glasses accordingly. There has been since then no further tendency toward the previous trouble, and the patient wears the glasses with a very great deal of comfort.

It may seem to some of the readers of this journal that I am threshing old straw in the subject I have presented, but if such be the case I beg to plead in extenuation that I have so frequently seen both points overlooked in the treatment of ulcers of the cornea, and as the etiology of this condition has considerable bearing upon its therapeutics I felt that they were deserving of more consideration than is usually accorded to them.

TWO CASES OF GLAUCOMA, FOLLOWING CATARACT EXTRACTION.

By S. MITCHELL, M. D.,
of Hornellsville, N. Y.,
Oculist and Aurist to St. James Mercy Hospital, Oculist to the Erie Railroad.

Glaucoma, following cataract extraction, fortunately is one of the more rare occurrences, attending this operation, yet the ophthalmic surgeon, who preforms extraction without iridectomy, may expect the pathway he pursues to surgical fame, will at sometime be made rough and thorny by one of those soul discouraging incidents, that occasionally follow and bring to naught an operation that was apparently crowned with success. Nor is the career of the surgeon who always performs extraction by the combined operation, one of perfect serenity, "calm and unruffled as a summer's sea," unmarked from start to finish by this calamitous sequela. I saw a case at Moorfield's Hospital in London, less than two years ago; where a successful extraction, performed with an iridectomy, and unattended with any incarceration of iris in the wound, was followed by glaucoma.

I was first prompted to write of my experience with glaucoma following cataract extraction, by receiving a visit from one of the gentlemen, whose case is spoken of farther on. My exhilaration of mind at the successful outcome of his case was of course natural and I at once resolved to publish it. The happy termination of a condition so serious and decidely *un*happy, struck me as being something worth telling to those interested in ophthalmology. Some days latter, as my thoughts along this line began to make their appearance upon paper, another case, similar in many respects to the one spoken of, but dissimilar in result came to my mind.

If some of the incidents in the course of one case were encouraging and soul cheering, I think all will agree that nearly all the incidents, that form the closing scenes in the history of the other case, were sufficiently depressing to prevent any undue elation on the part of the operator. Hence, it occurred to me that if both cases were published at the same time, it might prevent too much of the victory-snatched-from-the-jaws-of-defeat tone from prevading the whole article. So instead of performing the pleasant task of writing about a successful case only, I resolved to give the history of an unsuccessful, but none of the less instructive one, as well.

Case I. Mr. L., a gentleman 84 years of age and a widower. His occupation as an undertaker, had been sufficiently remunerative, to allow him at this age

to retire from business with a comfortable bank account, that permitted him to live at his leisure in a near by city. Although in his dotage and nearly blind from cataracts, the blindness seemed to be his only impediment to a thorough enjoyment of the many follies and pleasures that are supposed to be the prerogative of the giddy youth, rather than the octogenarian.

His vision was as follows: O. D. Fingers at ten feet; O. S. Fingers at two feet; Projection of light good in the left eye, and vision was normal.

The cataract was removed from the left eye by the simple operation, under cocaine anaesthesia. The operation was pefertly smooth and recovery uneventful. Sixteen days after the operation, the dense semi-opaque capsule was divided with a Knapp's knife needle. The eye at this time was nearly free from redness and there was no increased tension.

The reaction following the discission was insignificant. Thirteen days later vision was $\frac{20}{70}$ W. + 4 D. sp. ⊃ + 8 D. cyl. axis 165°, and J. 4. W. 11 D. sp., ⊃ + 8 D. cyl. axis 165°. Measured by the Javal ophthalmometer that was 13 D. of astigmatism, but the use of any stronger cylinder than 8 D. was not attended with any further improvement in vision. The eye was now free from redness and tension was not increased. The glasses were prescribed and a few days later he returned to his home. Just previous to his departure, his vision had improved to $\frac{20}{50}$. So this eye was numbered among the successes; only for the brief period of two months however, as succeeding events proved.

One morning two months later, my heart was saddened by the sudden appearance of this patient at my office. He informed me that he had experienced a very sudden and severe attack of pain in the eye operated upon, a few days previous, accompanied with headache and bilious vomiting. The sight of the eye, he said, declined rapidly. The pain and general wretchedness continued unabated, and indeed his whole appearance told more eloquently than his words, the story of his sufferings.

There was some enlargement of the blood vessels in the sclera, and T. + 2. The cornea was clear and the pupil dilated ad maximum. Vision was reduced to l. p.

A geneal haziness of the vitreous prevented an examination of the fundus. The anterior chamber was *deeper* than normal. This, together with the fact that the free border of the iris seemed to be curled backward, led me to believe that this part of the iris had become adhered to the edges of the button-hole in the capsule; thus impeding the flow of the intraocular fluid and high tension was the result.

No amelioration could be expected by the use of myotics, so long as the condition detailed above existed. So I decided to preform an iridectomy at once.

Under chloroform anaesthesia, assisted by Dr. W. E. Hathaway of this city, the usual opening for iridectomy in glaucoma, was made into the anterior chamber; but the iris having shrunken to such a narrow band, with the pupilliary border curved backward, it was impossible to grasp it with forceps. A firm hold on the membrane was secured, however, by the means of an iris hook, and the first effort at traction resulted in breaking, to quite an extent the adhesion that bound the iris. A copious gush of vitreous accompanied the breaking of the adhesions, and each effort to draw the iris out of the wound, only resulted in allowing more

vitreous to escape, until the globe became so flaccid that I desisted from further operative measures.

There was very little pain following the operation and the eye healed very kindly, recovery taking place rapidly and satisfactorily. The entire cessation of pain and the reduction of the high tension to normal, followed as the result of the operation.

Eserine was used for some time after the operation and there was a slight improvement in vision, but not sufficient to be of any service.

He was last seen two years ago; one year from the date of the last operation. At this time there was absolutely no change in his condition. There had been no return of pain, and tension was normal. The optic disc was very pale and slightly cupped, and the retinal vessels were small and threadlike.

Case II. Mr. S, a farmer 63 years of age, mature Cataracts in both eyes, vision amounted to l. p. only. Projection of light good. Tension normal. No enlargement of blood vessels of the sclera in either eye. He was first seen Sept. 6th, 1895, and on the 24th of the same month, the cataract was removed from the right eye. The operation was performed under cocaine anaesthesia, without iridectomy. The operation was smooth and satisfactory and recovery was uneventful. The eye was opened on the third day, and by the tenth day he was walking about the house and yard unattended, although a dense capsule, prevented anything like good vision. His condition had been vastly improved by the operation, and he was quite jubilant.

He returned to his home and remained for two weeks. At the end of this time, Oct. 25th, he presented himself for the second operation. A sickle-shaped knife-needle was employed and a transverse incision made in the capsule. The discission was followed by no reaction to speak of. Vision was greatly improved and three days later he visited my office. The ophthalmometer showed the astigmatism to be 6 D. axis 15°. Vision was $\frac{20}{50}$ W. + 6.50 D. sp. ⊃ + 6.50 D. cyl. axis 20° and J. 4″ W. + 11 D. sp. ⊃ + 6.50 D. cyl axis 20°.

These glases were procured for him, within ten days from the time of the last operation, and he returned to his home. Scarcely two weeks had elapsed, when one morning I received word from his physician, informing me that he had been called to see Mr. S. the day before, and found him suffering from very severe pain in the eye operated upon, attended with vomiting.

Of course I suspected at once that his trouble was an attack of glaucoma, and immediately notified his physician to have him come to me without delay. Notwithstanding my importunity, several days elapsed before he came. There was an interval of at least five days, between the onset of the disease and the performing of the iridectomy.

He reached my office at noon accompanied by his daughter. One glance at his eye confirmed all my suspicions as to the nature of his trouble.

The eye presented all the peculiar appearances, that mark a typical case of acute glaucoma. The ocular conjunctiva inflamed and somewhat chemotic, the cornea steamy, and the anterior chamber obliterated. The pupil was dilated to about double the usual size. T. + 2 and vision barely amounted to l. p. Eserine solution was instilled into the eye several times during the time that he was in my office, which was about one hour. There was no perceptible diminution of tension following its use. An appointment was made for the operation of iridectomy at

2 o'clock the same afternoon. At this hour, assisted by Dr. Charles Phillips of this city, I did a very free iridectomy upward on the eye, while the patient was under complete anaesthesia, secured by A. C. E. mixture.

Although some vitreous escaped during the operation, I was not only able to remove a good generous piece of iris, but I passed an iris hook into the pupillary space and enlarged the opening in the capsule. The eye healed very nicely and immediately began to improve in every particular. The eserine drops were continued during the process of healing. Pain and tension were greatly relieved by the operation, and vision also began to improve, so that when he returned to his home, two weeks after the operation, his vision was $\frac{18}{100}$ W. + 9.50 D. sp. and J-5 could be read rather imperfectly W.+ 18 D. sp. I heard from him occasionally during the summer, and learned that his vision had steadily improved, and that he was able to do some work about his farm. Using the glasses that were first prescribed.

He came to see me on the 6th of last November. Just one year from time the operation for iridectomy was performed. The eye appeared perfectly well and tension was normal. There was a nice clear black pupil. And is it any wonder that my heart swelled with pride, as I looked upon the symmetrical coloboma, the making of which, a year before, seemed but a forlorn hope.

Vision was $\frac{20}{40}$ W. + 9 D. + sp. $\bigcirc$ + 4 D. cyl. axis 30° and J-4 could be read fluently, W. + 11 D. sp. $\bigcirc$ + 4 D. cyl. axis 30°.

In closing I will add that I am inclined to ascribe the failure in Case 1, to the irreparable injury done the nerve and retina, early in the disease; rather than to the fact that a piece of iris was not removed.

The relief to pain and tension, secured at once, demonstrated beyond a doubt that the cause of the plus tension had been reached and removed by the operation as performed.

DIPHTHERITIC CYCLOPLEGIA CURED BY A SECOND ATTACK OF DIPHTHERIA.

By F. PARK LEWIS, M. D.,

Of Buffalo, N. Y.

Very little has been written concerning the value of antitoxin in other than acute diphtheritic processes. In some forms of membraneous conjunctivitis its value has been manifest, but instances are so unusual in which an acute development of the diphtheritic poison has on passing away taken with it the results of a previous infection as to make the following case worthy of record:

Miss S., a trained nurse, was taken ill with what her physician considered to be a very light form of follicular tonsillitis, in the early part of March, 1896. She was isolated as a matter of precaution and confined in bed for one week. Her illness was so slight, however, that it was not deemed necessary to have a bacterio-

logical examination made of the few white patches that appeared on the tonsils. The breath was not offensive, there was no great loss of strength, indeed almost all of the characteristic indications of true diphtheria were wanting. At the end of a week she had fully recovered her normal physical tone which was never very high, her strength having been gradually exhausted by protracted overwork, She then began to complain of difficulty in seeing, and having been referred to me by her attendant, Dr. G. R. Stearns, I found both pupils dilated ad maximum, with complete paralysis of the accommodation. A careful refractive test was then made, and her vision was found to be R. +5.50 D. sph., V. = 0.7, L. +5.50 D. sph., V. = 0 7. The ophthalmometer showed in each eye half a diopter with the rule. The muscles were all weakened, abduction 1°, adduction 9°, R. sursumduction 1°, L. sursumduction 1°. The cycloplegia prevented, of course, muscular tests at a proximal range. Ophthalmoscopic examination was negative. Various methods of treatment were resorted to for a number of weeks, including strychnia, faradization and, finally, an injection of antitoxin was made without in any way modifying the condition of the accommodation, the antitoxin disturbing her stomach and causing general discomfort. As she was far from strong, she took a long vacation, resting during the summer, and did not come to see me again until October, when the condition of the pupil was found unchanged, with no improvement in the strength of the ciliary muscle. She had, however, a small chalazion forming on the left lower lid on the inner margin near the canthus. An interesting fact was developed in this connection. A most careful test for astigmatism had previously been made ; the ophthalmometer now showed for the left eye an overlapping of 1.25 D. at an angle of 75°. With +0.50 D. cyl. at an angle of 75°, V. = 1 In the right eye the ophthalmometer showed 0.50 D. at 100°. With +0.25 D cyl. axis 100°, V. = 1.

A phenomenon previously observed and worthy of careful study showed in this connection is that with the formation of chalazia we have sometimes, at least, changes in corneal curvature, and it is worthy of careful study to determine whether this is due to the pressure of the tumor upon the eyeball, or to some disturbance of innervation, which at once affects the lid and a corresponding meridian in the cornea.

Another interesting fact in this connection is that a small amount of astigmatism which had not previously existed, was found to have arisen in the corresponding meridian of the fellow eye ; but that is another story. Along in the fall the function of the ciliary muscle in the left eye began gradually to be restored, and the pupil had reached perhaps half its normal size, the right remaining still widely dilated, when on January 17th, nearly a year after her first attack, she was taken seriously ill with unquestionable diphtheria. The temperature rapidly reached 106⅕, and ultimately 106⅗. Her chart showed that the treatment of her physician, Dr. Moseley, consisted of protonuclein, the throat being swabbed with peroxide of hydrogen, with an injection of antitoxin. The disease was quickly controlled, and the chart was discontinued at the end of a week, and very shortly after the patient discharged It was found that as convalescence progressed the accommodation was gradually restored, and by the time that she was fully recovered the pupil had become normal in size, and the functional activity of the ciliary muscle was fully regained.

A CONTRIBUTION TO QUININE BLINDNESS.

By A. W. CALHOUN, M. D., LL. D.,

Of Atlanta, Ga.

A ten year old girl was brought to me from one of the river bottoms of Arkansas with the following history :

The family lived in a low flat section of country immediately upon the banks of a river, where malarial fevers prevailed at certain seasons of each year. In this neighborhood several persons had died of congestive chills. The population was composed entirely of farmers who had been taught by their physicians to rely upon the free use of quinine in the treatment of all malarial affections, especially congestive conditions. Every house kept several ounces of quinine on hand, and the prevailing practice was to give large and repeated doses when the first evidence of a congestive chill was manifested.

This child had a chill which the father diagnosed as congestive, and a large dose of quinine was promptly administered. No precautions were taken to weigh or measure the doses, but they were simply poured from the ounce bottle. The fever and an occasional rigor continuing, frequent and large doses of the quinine were given until, at the end of the third day, the child had taken one and a half ounces or 720 grains, the entire quantity on hand. The lack of more quinine and the unconscious condition of his daughter alarmed the father sufficiently to induce him to call in his family physician, who lived twenty miles distant. The doctor at once recognized the true state of things, and after several days of vigorous treatment brought the patient back to consciousness, but she was totally blind. Her general health improved so slowly that not until the end of six weeks was she able to travel and be brought for treatment of her eyes.

The ophthalmoscope revealed a typical white atrophy of both optic nerves, with not the faintest perception of light, and the blood vessels of the fundus were diminished to mere threads. The pupils were widely dilated and responded to light very imperfectly. The hearing had been much affected also, but had greatly improved, so that ordinary conversation could be heard at five or six feet. I gave a most unfavorable prognosis, but kept the patient under treatment three or four weeks, hoping to accomplish something. Strychnia, electricity and general tonics were given with marked benefit to her physical condition and with some improvement of her hearing, but the total blindness remained permanent.

I have not infrequently found patients whose vision was more or less affected by quinine. A prominent physician of this state assures me that 10 grains of the drug will diminish his vision very materially, and that a continuance of the dose two or three times in succession produces an alarming diminution of sight.

In the "*Transactions of the American Ophthalmological Society*" for 1891 Dr. de Schweinitz reports some interesting experiments showing the effects of quinine on dogs. Injections, hypodermically, of from 1 to 4 grains to the pound produced blindness in from 3 to 14 hours, and an injection of 3 grains to the pound produced death in one

case. He found that the effect of quinine upon the dog's retina and optic nerve was very much the same as that upon the human subject.

Although the literature on the subject of quinine amblyopia or blindness is abundant, I find many physicians unaware of any such danger. It is to call the attention of the general practitioner to the possible bad effects of quinine that I beg leave to report this very typical case.

A CASE SHOWING IN A PECULIARLY MARKED MANNER ONE OF THE EFFECTS OF EYE-STRAIN.*

By G. HERBERT BURNHAM, M. D.,

F. R. C. S. Edinburgh, M. R. C. S. England, Associate Professor of Ophthalmology and Otology, Toronto University, and Oculist and Aurist to the Toronto General Hospital and Mercer Eye and Ear Infirmary.

George R. S——, aged 58 years, was sent to me Sept., 1894, by Dr. Millward, Grimsby. The patient gave me the following history:

Twenty-eight years ago there began a severe pain in his left eye, temple and side and back of head, which lasted more than one year. At times the pain was so agonizing that frequently during this period hypodermic injections had to be given.

At the end of this time the pain gradually lessened in violence and a few months later was gone. The sight of the eye then became very poor, that is perception of large objects merely. His head and eyes, he says, gave him no trouble till four weeks prior to consulting me, when a pain began in his right eye, temple and side and back of the head. It quickly assumed the same degree of severity, in fact it exactly resembled the pain which he had in his left eye twenty-eight years before. During these four weeks he was frequently given hypodermic injections of morphia on account of the agonizing pain. On examination I found the left eye with a normal fundus and a good deal of hyperopic astigmatism; the right was also normal, but showed a small amount of hyperopic astigmatism. I ordered glasses as follows: Distance, R. +0.50 sp. ⊃ +0.50 cyl. ax. 180, L. +3. cyl. ax. 180°. Reading, +2.50 sp. was added to each eye. I ordered him cemented bifocals to be constantly worn and gave him no medicine.

In two months afterwards he reported to me, saying that since the use of the glasses the pain had disappeared and he had felt no return whatever. This was, of course, a very gratifying result. He felt that the change in his left eye was almost miraculous because useful vision had been restored to an eye that he believed to be blind for 28 years. The conclusion seems naturally to be that the agonizing pain in the left eye 28 years ago was due to the great efforts the eye had

* Read before the Toronto Medical Society February 18th, 1897.

made to overcome the error of refraction and secure binocular vision. With the cessation of these efforts, that is with the almost total suppression of the image of the left eye, the pain vanished. No return was *felt* till the error of refraction of the right eye, combined with the presbyopia, caused undue efforts to be made. That as fierce nerve-center explosions had been caused years ago from overstrain, these centers were much more easily aroused, than they otherwise would have been, to a display of excessive acuity. That the trouble with the right eye did not occur earlier was because the glasses he was wearing, when he consulted me, had sufficiently aided the right eye to cause a delay but not to prevent a nerve-storm. The correction of the left gave excellent vision $\frac{20}{20}+$. One question that might be asked is, why did not the pain begin before he was 30 years of age, as the error of refraction was always present? To that I cannot give any more accurate answer than that it is sometimes impossible to say when a person having an error of refraction will begin to suffer from the consequences of eye-strain. Often the effect of the eye-strain shows itself very early and again not till very much later. The reason of this is very difficult to give, but often the surroundings, occupation and certain peculiarities of the nervous system seem to be potent factors.

This case also shows the great necessity in all affections in any way connected with the head of remembering the peculiar and apparently out-of-the-way effects caused by eye-strain. In all central disturbances showing the alarming symptoms presented by the case under consideration, a most careful and exhaustive examination should be made. It is not at all derogatory to the general practitioner to say that it is impossible for such an examination to be made by him. Neurologists now seem to take a much more favorable view of many nervous affections than they once did; for they have realized that the so-called incurable structural lesions are not as great a factor in every case as they once thought. In May, 1896, I received a letter from the patient herein mentioned, who said that ever since he began to wear the glasses I ordered him in Sept., 1894, the pain completely disappeared.

I have narrated this case to impress upon the members of the medical profession the peculiar nature and very great severity of some of the nerve-center explosions due to over-strain of the eye.

OCULAR AFFECTIONS IN CONNECTION WITH GENERAL DISEASES.—A REPORT.

By ROBERT L. RANDOLPH, M. D.,
Baltimore, Md.

1. Einiges ueber Augenerkrankungen bei Gicht. Von Professor Dr. A. Wagenmann in Jena. (Archiv. fuer Ophthalmologie, Bd. XLIII, Ab. I.)

2. The Ocular Complications of Typhoid Fever. Charles Stedman Bull, M. D., of New York. (Medical Record, April 24th, '97.

I

In the last number of von Graefe's *Archives of Ophthalmology* Wagenmann has an interesting article on the affections of the eye met with in gout. He calls attention to the fact that not until quite recently have ophthalmologists attributed any importance to gout as one of the etiological factors in eye diseases. He mentions Leber and Michel as being among the first to recognize the fact that there is such a thing as a gouty eye affection. A certain amount of doubt must surround the whole subject on account of the difficulty of establishing the existence of gout in many cases, for it is known that the disease has many obscure ways of showing itself and is often ushered in by the most misleading symptoms, as for instance migraine, dyspepsia and eczema. Even a well marked acute attack of gout is not infrequently confounded with acute articular rheumatism. The diagnosis then of a gouty diathesis presents many difficulties. The fact that gout is common in England and France explains why French and English ophthalmological literature contain so much on the gouty affections of the eye. It will be noted that inflammation of the sclera and iris are most often spoken of and among those who have written a good deal on this subject are Nettleship, Hutchinson, Gauté, Galezowski and Zychon. The latter speaks of the following affections as often caused by the gouty diathesis: lithiasis of the lids, eczema of the lids, keratitis marginalis, scleritis, iritis which latter is often characterized by a great tendency to hemorrhages and is very painful, choroiditis, cyclitis, retinitis, presenile cataract, migraine with sensory disturbances and finally paralysis of the ocular muscles. Wagenmann goes on to describe a case which in many respects is interesting. There was at first a circumscribed congestion of the eyeball which lasted several weeks and

was not accompanied with any pain. Visual disturbance then followed. This visual disturbance was found to be due to a circumscribed detachment of the retina, suggesting the presence of a choroidal tumor. Three days after this condition was discovered irido-cyclitis with violent scleritis set in. Hand in hand with the eye symptoms it was observed that the general condition was suffering. Nodules appeared in different parts of the body, and these changes practically established the diagnosis, i. e. a case of true gout, and the nodules were deposits of uric acid salts. It is remarkable that the patient had never had any pains in the toe and the only evidence which existed previous to this attack was the presence of a few nodes in several portions of the body. The nodules in the sclera and fundus are to be regarded as similar in composition to the nodules elsewhere in the body. The case went on to the formation of pus in the anterior chamber. The termination of the case was rather surprising, for the inflammatory symptoms rapidly abated and finally disappeared. The retinal detachment flattened out, leaving only a discolored area to mark where it had been. The vision subsequently reached $\frac{20}{40}$. Leber has called attention to the fact that uric acid is not apt to set up destructive changes in the tissues and that such a process often rapidly recedes. The case reported by Wagenmann is certainly a confirmation of Leber's views. Wagenmann also mentions several cases where the gout manifested itself in marginal keratitis, and one case where frequently recurring chalazia might properly have been regarded as an ocular symptom of gout. Among the most interesting of the gouty eye diseases is the episcleritis periodica fugax so recently described by Fuchs and is mentioned by von Graefe and later on by Nettleship, Hutchinson and others. Fuchs does not seem to think however that this form of episcleritis is caused only by gout, for he says that any disturbance in the metabolic process, such for instance as intermittent fever or rheumatism, can give rise to the disease. Wagenmann reports several cases of this form of episcleritis. In one case the disease was characterized by frequently recurring and disappearing opacities in the vitreous body of both eyes and finally detachment of the retina occurred in one eye. Leber reported several years ago a case where repeated attacks of vitreous opacity had been relieved by the use of Carlsbad water.

A case is mentioned by Wagenmann where there was present in one eye retinitis hemorrhagica and in the other eye episcleritis periodica fugax. Most of the cases reported have been in elderly men and nearly all of them gave marked proof of having a gouty diathesis. Wagen-

mann goes on to speak of the well known connection between the gouty diathesis and glaucoma, a subject which has provoked so much discussion on this side of the Atlantic, notably Risley, Ritchie and others. In one of the cases reported by Wagenmann the glaucoma showed no improvement under the local measures usually employed in the treatment for the disease and yielded only after antiarthritic remedies had been used. Gout can light up or intensify the disposition to glaucoma by certain changes in the blood vessels, through the tendency to inflammation of the choroid and endothelial spaces as well as through the processes in the choroid which leads to rigidity of the sclera. The treatment of the gouty affections of the eye hinges largely upon the employment of the usual antiarthritic remedies, among which Carlsbad water seems to play the most prominent part in the armamentarium of the continental ophthalmologists.

II

Bull calls attention to the fact that various lesions of the eye may occur in typhoid fever, not only during the height of the disease but also during the period of convalesence. These lesions in the order of their frequency may be enumerated as follows: *Conjunctivitis:* which is characterized by no marked objective symptoms, such as sticking together of the lids or swelling of the latter. The inflammation is usually confined to the palpebral conjunctiva and the patient complains of the lids feeling rough and hot. *Phlyctenular Conjunctivitis, Keratitis.*—There is a development of clear transparent vesicles usually along the corneal margin. These vesicles do not suppurate but ulcerate, discharge clear contents and then dry up and leave no trace behind them. These phlyctenular affections are apt to be seen in the period of convalescence.

Loss of Accommodation and Paralysis of the Sphincter Muscle (causing dilatation of the pupil) are by no means infrequent symptoms in typhoid fever. Both these conditions may occur at the height of the disease as well as during convalescence, and they are due to the general asthenic condition of the patient rather than to any lesion of the iris or of the ciliary body. *Retinal Hemorrhages.*—More commonly the hemorrhages occur in the height of the disease and they may be so extensive as to break through into the vitreous body. These cases are the ones which are usually accompanied with intestinal hemorrhages. The hemorrhages are punctate, linear and flame-shaped, and they lie in the inner layers of the retina and usually occur in the third week of

the fever. Unless at the macular region they do not materially interfere with vision. The causation of these hemorrhages is obscure. They are probably not caused by ulcerative processes such as we find in the intestines, but to what is known as diapedesis resulting from pathological alteration in the walls of the blood vessels through which the blood corpuscles escape. Neither embolism nor thrombosis is to be found in these cases, and hence there is no question of the occlusion of vessels.

A very interesting case of ocular trouble in typhoid fever is reported by Finlay of Havana (*Archives of Oph.*, vol. xxvi., No. 1). A boy of ten was in the third week of the disease when ecchymotic spots appeared on both conjunctivæ. The corneæ of both eyes sloughed out entirely and the vitreous body of the left eye became a mass of clots. The case was regarded as one of spontaneous orbital and intraocular hemorrhage. There must have been some degenerative changes in the walls of the blood vessels or, as Finlay suggested, there may have been a complicating purpura, for at one time there were to be seen a large number of ecchymoses in various parts of the body. *Paralysis of External Muscles.*—These muscular palsies almost never occur in the height of typhoid fever but during convalescence and sometimes long after. The prognosis in such cases is very good. *Retinitis or Retrobulbar Neuritis.*—This complication is supposed to be due to a more or less circumscribed meningitis at the base of the brain. Atrophy of the nerve is usually the result. The ophthalmoscopic picture resembles that of retrobulbar neuritis due to indulgence in tobacco and alcoholics. Von Peterhausen, Leber and Deutschmann report cases where the neuritis was associated with retinal hemorrhages. Defects in the visual field are very common in the period of convalescence. *Inflammation of the Uveal Tract.*— Iritis, cyclitis, and choroiditis both serous and plastic are occasionally seen in the height of typhoid fever. The inflammation is never purulent. Vision as a rule is permanently impaired, especially when either the choroid or the ciliary body is involved.

THE
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EDITORIALS.

THE OPHTHALMOLOGICAL SECTION OF THE INTERNATIONAL MEDICAL CONGRESS.

In a note in French addressed to the editors of the RECORD, the sub-committee requests that prospective readers of papers send abstracts of their contributions at once to Prof. A. Krakow, *Clinique Ophtalmologique*, Moscow, Russia, so as to insure their early publication. The subjects for discussion, proposed by the committee, will be introduced as follows:

1. M. le Prof. *von-Hippel* (Halle a S.): "Ueber die operative Behandlung der hochgradigen Myopie."
2. M. le Dr. *Fukala* (Wien): "Der gegenwärtige Stand der Myopie-Operationen."
3. M. le Prof. *Uhthoff* (Breslau): "Ueber die Bakteriologie der Hornhaut und Bindohautenzundungen."
4. M. le Prof. *Reymond* (Turin): "Valeur therapeutique des injections sousconjonctivales."
5. M. le Prof. *Hirschberg* (Berlin): "Die Bekämpfung der Volkskrankheit Trachoma."
6. M. le Prof. *Kuhnt* (Königsberg): "Zur Therapie des Trachoms."
7. M. le Prof. *Knapp* (New York): "La Nature et le traitement mecanique de la conjonctivite granuleuse."
8. M. le Prof. *Raehlmann* (Juriew-Dorpat): "Ueber den Heilwerth der verschiedenen Behandlungs-Methoden bei Trachom."
9. M. le Priv-Doc. *Niesnamoff* (Charkow): "Principien der gegenwärtigen chirurgischen und therapeutischen Behandlung des Trachoms."

To March 25th the following titles have been announced :

1. M. le Dr. *Nieden* (Bochum) : "Ueber den Einfluss der Anchylostomiasis auf das Auge" (mit Demonstration).
2. M. le Dr. *Javal* (Paris) : "La prescription des verres doit tenir compte des variations soit favorables, soit defavorables, que peut subir la refraction sous l'influence des verres correcteurs."
3. M. le Dr. *de-Wecker* (Paris) : "Guerison artificielle et spontanee du decollement de la retine."
4. M. le Prof. *Reymond* (Turin) : "Les erreurs de projection du champ visuel dans le strabisme et leur correction educative."
5. M. le Prof. *Magnus* (Breslau) : "Die Entwickelung der verschiedenen Staarformen."
6. Me le Prof. *Stilling* (Strassburg) : "Ueber die Faserkreuzung im Chiasma" (mit Demonstration).
7. M. le Dr. *Meyer* (Paris) : "Asepsie et antisepsie dans la pratique ophtalmologique."
8. M. le Dr. *Parinaud* (Paris) : "La vision binoculaire."
9. M. le Prof. *Pagenstecher* (Wiesbaden) : "Ueber die Behandlung der Asthenopie."
10. M. le Dr. *Fukala* (Wien) : Thema vorbehalten.
11. M. le Dr. *Chibret* (Clermont-Ferrand) : "La ponction sclero-cyclo-irienne dans le traitement chirurgical de glaucome."
12. M. le Dr. *Galezowsky* (Paris) : "Glaucome et syphilis oculaires."
13. M. le Prof. *Nuel* (Liege) : "L'amblyopic toxique n'est pas primitivement une nevrite interstitielle du nerf optique, mais une maladie de la macula lutea."
14. M. le Prof. *Knapp* (New York) : "Considerations sur les operations de cataracte basees sur une statistique etendue d'observations et inedites."
15. M. le Prof. *Schmidt-Rimpler* (Göttingen) : "Zur Enstehung der Netzhaut-Ablösungen."
16. M. le Prof. *Angellucci* (Palermo) : "Le role de la III Epaire dans les mouvements pupillaires."
17. M. le Prof. *Angellucci* (Palermo) : "La peinture des peintres daltoniens."
18. M. le Prof. *Kuhnt* (Königsberg) : "Ein Beitrag zur Anatomie der menschlichen Orbita."

19. M. le Prof. *Kuhnt* (Königsberg): "Bezrehungen zwischen den Erkrankungen der Nebenhöhlen der Nase und dem Sehorgan."
20. M. le Prof. *Hirschmann* (Charkow): "Ueber Abhängikeit einiger pathologischer Process im Auge von der Störungen vasomotorischer Nerven."
21. M. le Prof. *L. Bellarminoff* (St. Petersburg): "Sur le tatouage de la cornee."
22. M. le Prof. *L. Bellarminoff* (St. Petersburg): "Organisation des mesures prises en Russie contre la cecite et les affections oculaires par la Societe *Marie* au profit des aveugles."
23. M. le Dr. *Wagner* (Odessa): "Statistik und operative Heilung des Glaukoms."
24. M. le Prof. *Th. Evetzky* (Moscow): "Zur Pathologie der Retinitis albuminurica."
25. M. le Priv. Doc. *S. Golovine* (Moscow): "Recherches sur le poids specifique de l'humeur aqueuse."
26. M. le Priv. Doc. *S. Golovine* (Moscow): "Traitement chirurgical des affections du sinus frontal.

It will be noticed that not a single paper is as yet announced in the English language. We hope that America will be further represented and that the discussions will not be entirely confined to German and French. C. A. W.

OCULISTS AS SCHOOL INSPECTORS.

A recent New York daily contains the statement that a plan is being considered by the Board of Health of that city by which oculists are to be selected who are to supplement the work of the regular medical inspectors with the difference that while the work of the regular inspector occupies but a small part of the day "the oculists are to work right along, each in his district, in which there will be as many as a dozen schools. With ten or twelve such inspectors at work, the whole school population ought to be overhauled in the course of the year." The Board of Education are expected to be heartily in accord etc. In some respects the idea is worthy of consideraton and certainly the eye, an organ of special sense of such inestimable importance to the future success of the young individual should receive at least as much if not more attention than other parts of the body, the throat for instance. The matter of the amount of light,

the direction whence it proceeds, the tints of the walls and ceiling are of supreme importance as is also the correction of the school room misfits still too common. The first of these necessities are more or less permanent and ought to have gone to make up a perfect school building as far as possible in the first place while the selection and adjustment of a suitable desk, although more nearly within the province of the hypothetical inspector, might safely be left to a person of sound judgment who has a practical interest in education. Where the child sits in the school room depends largely upon the amount of natural vision possessed, which in many cases is determined by the teachers themselves, by means of charts provided for the purpose and this answers very well, for the time being. To anyone who is at all familiar with the workings of an Eye clinic in a large city, it is easily apparent that there should be some sort of an intelligent supervision of the eyes of the growing child, and how frequently do we hear the question asked at our office, "Why is it that so many more children wear glasses than formerly?" It is with the best of intentions no doubt that this overhauling of the school children will be undertaken, and it is to be hoped that it will fall into the hands of conscientious ophthalmologists who are appreciative of the data that will be obtained. It is evidently the intention not to confine the limits of the work to the elimination and isolation of those suffering with contagious ophthalmias alone, but also to undertake the diagnosis and correction of errors of refraction, in short, to assume a serious responsibility and which will fully occupy the time allowed. The relief thus caused will of course be very acceptable to the overworked refractionist of the overcrowded charitable eye clinics; but will the innovation be equally pleasing to the practitioner who is conscious of members of certain families "in good circumstances" being diverted from natural channels? At the present time something more is considered necessary than a box of trial lenses and a card of letters for work of this sort and it will be interesting to note whether suitable provision will be made or whether complicated errors of refraction will continue to be referred to the Hospital clinics for further attention, as has been the custom of many of the teachers of the public schools who have noticed that a scholars vision is defective or that there is some unusual redness or discharge. Unless the examinations are made with care it were much better that the plan be abandoned and it does not seem reasonable to suppose that the Board of Health realize the difficulties in establishing and maintaining so many completely

appointed examining rooms in the different districts in order to carry on the work properly, nor have they probably gone into the question of mydriatics in tests of this sort. When investigation is of so great importance that each individual case should be considered separately, and not as one of a group of somewhat similar affected individuals, it should not be carried on by wholesale, so to speak, lest it become merely perfunctory, and thus possibly might not compare favorably in some instances with what is accomplished at the charitable institutions; still less can it be compared with what comes from the office of the practicioner. The responsible heads of the families to which belong the scholars attending the public schools can be classified as comprising those who are able to pay their ocul st, those who are able but unwilling, and those who are unable. In the last class will be found a larger proportion of school children who are under fourteen or thereabouts, for at or about that age, the offspring of the poorer classes are put to work, and it is with these children if any that the inspectors have to do, and the benefit that they derive will be in proportion to the care and attention they receive personally, while with the two other classes the inspectors, as such, have no concern whatever. But here one is immediately confronted with a problem that has never yet been satisfactorily solved by the managers of charitable Institutions and it is not to be supposed that a Health Board will meet with any better success. The question of prophylaxis,in epidemic ophthalmias, however, and the growing importance of bacteriological research is an interesting one and it is to be hoped that with the facilities which the New York Board of Health can offer in this direction the new inspectors will be able to explain much that still remains obscure regarding the behaviour of many of the micro-organisms which are found about the eye when in a state of inflammation. W. D. H.

THE HYGIENIC SURROUNDINGS AFTER CATARACT EXTRACTION.

It is a pleasure to observe the advances in ophthalmology. We are every day casting aside old laws and adopting more modern and at the same time better methods that are more in conformity with rational principles. How often a patient tells us that several years ago he suffered from an attack of ocular inflammation, and for a number of months was confined to a dark room. Not very long ago it was customary to always put a patient to bed immediately after cataract

extraction, and the room was darkened so that it was necessary for the attendant to carry a candle to see to get about. In addition to all this the unfortunate victim's head was swathed in bandages, and over those black cloths. What was the result from a hygienic standpoint? No light, no air, and an accumulation of dirt. Is it a wonder that cases of acute mania have been reported after cataract extraction?

Certainly a room well ventilated and with sufficient daylight to enable one to see the accumulation of dirt is a much more sanitary provision for any ophthalmic patient. If it is desirable to protect the eyes from the light it can be done efficiently by local means, and not by darkening the room.

Requiring a patient after cataract extraction to go to bed for several days may not be as productive of as good results as to allow him to sit up in a comfortable chair, retiring at the proper time, when a good night's rest will be the result. What we desire for such patients is rest and quiet. Most people who are not sick do not obtain rest by being compelled to lie on their backs for several days, but on the contrary are restless and fretful. If there is anything in gravity we should not have prolapsus of the iris as frequently with the patient in the vertical position as in a recumbent position.

We find upon visiting our leading ophthalmic hospitals throughout the country, that the minority still cling to dark rooms and put cataract patients to bed as a general routine, but the majority have been converted to that which bears on its face the stamp of modern hygiene. G. M. B.

EMPIRICISM IN OPHTHALMOLOGY.

Empiricism is yet our portion. The effect, however, upon the mind of the young oculist, of two papers relating to asthenopia recently read and reported with full discussion, is likely to be one of doubt and confusion.

The one read at the meeting of the Western Ophthalmological, Otological, Laryngological and Rhinological Association on "The Value of Weak Lenses in Moderate Errors of Refraction" emphasized valuable data, but neither in paper or discussion were the important tests for the *axial* adjustment of the eyes as much as mentioned, though it is admitted that comfortable vision requires that this adjustment conform or approximate to certain physiological standards and thus be harmoniously coördinated with focal adjustment.

Such *routine* tests, besides that for the range of accommodation, are: Those for the range and relative range of convergence; for the muscular balance; *and for the abduction and adduction as ascertained by carefully levelled double rotary prisms.*

Many reports of cases are incomplete or unintelligible which do not include these tests, since the reader must guess whether or not they were made, while the examiner without them can form no adequate estimate as to their ocular condition, and, fearing (as the discussion showed) that the lenses prescribed would give pain, corrects the refraction on a sort of installment plan, instead of patiently seeking the trouble in a disturbance of the relative range of convergence or some latent but potent heterophoria.

In the other paper on "Asthenopia Not due to Refractive Errors," read before the Chicago Ophthalmological and Otological Society, the author, an oculist of great ability and wide experience, stated that while he did not wish to deny that there are cases of muscular asthenopia, he had never happened to meet any of them in his practice.

The fact is, the therapeutics of muscular asthenopia, as long as the physiology of the ocular muscles remains incomplete, will be equally so; they who believe muscular asthenopia rare will find few evidences of it, and the opposite will hold for those who do find these evidences.

Nevertheless methodical care and skill are as necessary in ascertaining the status of the axial, as are now known to be necessary as regards that of the focal adjustment, although the interpretation of, and due weight to be given to the findings of tests for the former are, at present, by far the more difficult. In the meantime many ophthalmologists hover between the horns of partial refractive correction with its temporary relief, and total correction with its chances of a discarded pair of glasses. As long as this empiricism exists the optician and so-called "ophthalmic refractionist" will now and then score against them.

F. B. E.

A PLEA FOR THE RETURN TO IRIDECTOMY IN CATARACT EXTRACTION.

The present generation of doctors is being practically taught that the simple extraction is the only operation for the relief of hard cataract. Such teaching is unfortunate, inasmuch as the extraction with iridectomy has been unwisely thrust aside, and especially as the

increased dangers of the simple extraction, the greater length of time required to effect a cure, and the consequent increased trouble and expense is an injustice to the patient.

At all of the large medical centers it has become the fashion to do only the simple extraction, and as a consequence the medical student or the young doctor in post graduate schools has no opportunity of comparing this operation, its complications and its results, with the extraction with the iridectomy.

As a natural result the majority of the younger oculists adopt this mode of operating and are surprised to find themselves confronted with many serious difficulties. A large personal experience in cataract extractions and an observation based upon witnessing the operations of a number of the most eminent operators in this country and abroad, convinces me that we should return to the iridectomy in cataract extractions, both for the convenience of the operator and the safety of the patient.

I admit that the ideal cataract operation is that which leaves a *clear* circular pupil, but every experienced operator appreciates the obstacles encountered in attaining such an end. Why jeopardize the patient's vision by reason of a prolapsed iris? Why compel him to submit to a secondary operation? Why needlessly delay the joy of restored sight, when nothing more is to be gained than a circular pupil?

At least ten per cent. of simple extractions are followed within twenty-four hours, if not immediately, by a prolapse of the iris. If it happens during or just after operating, an iridectomy is at once done, but if it had been done before the delivery of the lens it would have greatly simplified matters and diminished the dangers to the eye. To replace a prolapsed iris is sometimes difficult and always hurtful, for although the attempt is successful the iris is bruised and an iritis is almost certain to follow. It is far better to draw out the prolapse and clip it off. When the accident happens after the eye has been bandaged and the patient put to bed, the complication increases, for now the prolapse must be removed under chloroform. It would have been much better to have made the iridectomy in the beginning.

It is almost the rule after simple extraction to operate sooner or later for secondary cataract. With a narrowly contracted pupil it is extremely difficult and hazardous to dislodge and expel the remaining cortical substance. The effort to do so is liable, not only to cause a prolapse of the iris, but a loss of vitreous. Because of these accidents

I have seen many good operators content themselves with simply delivering the nucleus, leaving a large portion of the cortical, expecting to needle it later on. Quite recently a distinguished operator in one of the post graduate schools, in attempting to remove the cortical substance after a simple extraction, had such a loss of vitreous that he thought it wise to enucleate the ball a few days later. With the iridectomy all the cortical substance is easily removed by gentle manipulation and the pupil left clear and black, with but little risk of loss of vitreous. Besides there is rarely any need for a secondary operation, for every portion of the lens has been removed. It is a great injustice to the patient to endanger his vision by reason of a prolapsed iris and a loss of vitreous, and then after weeks of patient nursing send him home, to return several months later to submit to a second operation. The iridectomy almost certainly does away with these dangers and the enforced delay in the completion of the operation.

Is the acuity of vision increased by the simple extraction? After witnessing this operation by a most distinguished operator, who probably does more simple extractions than any other man in this country, the question was asked if the vision after simple extraction was more acute than that after extraction with iridectomy? The answer was that there was no perceptible difference.

In summing up, the chief advantage claimed for the simple extraction is the circular pupil and the absence of any disfiguring appearance of an operation. But over against this stand the many advantages of the extraction with iridectomy, namely, the comparative exemption from a prolapsed iris, the infrequency of loss of vitreous, the facility with which the remaining cortical substance can be expelled, thereby avoiding in great measure the formation of secondary cataract and the consequent operation, which brings discouraging delay, mental worry and additional risk to the eye.

If it is true, as has been said, that the simple extraction is the more difficult operation, what an injustice is put upon the patient in not making the iridectomy, which avoids the dangers with a greater degree of certainty and loses not a single advantage.

A. W. C.

REPORTS OF SOCIETIES.

AMERICAN MEDICAL ASSOCIATION.

Ophthalmological Section.

The meeting was called to order by the President, Dr. G. E. de Schweinitz, who said: "In the general rejoicing of the American Medical Association on its fiftieth anniversary, the Ophthalmic section heartily joins, and all the more heartily because by reason of its own clean record, steady development and fair achievements, it has become a model section—I may be pardoned if I say *the* model section—of this notable gathering of American Physicians and Surgeons. To have been chosen to preside over its deliberations is a satisfaction for which I return my sincere thanks; to become the successor of the men who have labored so hard and so productively for the advancement of this section and for the credit of ophthalmology is an honor I highly appreciate; to welcome you, my confreres, perhaps I may be permitted to say, my friends, on this occasion and all other occasions when you shall gladden us with your presence, is a pleasure I greatly enjoy." Dr. de Schweinitz then announced the subject of the Chairman's annual address to be **"Glaucoma Following Traumatism, Unassociated with Dislocation of the Lens,"** and the following is a brief abstract of his paper: "To introduce the topic the following case may be reported." The phenomena in this case were: "Contusion of the left eye ball, with slight laceration of the conjunctiva, but without dislocation of the lens; between the 7th and 22nd day after the injury, the development of the optic neuritis, quick arterial pulsation and slight increase of the intraocular tension, with marked depreciation of central vision and contraction of the field of vision; at first, improvement under the influence of eserine, associated with general subsidence of the neuritis, the improvement lasting about two weeks; later, at the end of three weeks, renewed depreciation of vision with formation of a cup in the nerve head; gradual increase in depth of the cup and the atrophy of the nerve until (treatment having been entirely disregarded) vision was reduced to nil; throughout the entire course of the affection moderate, increased tension, (+ 1) and quick arterial pulse, which presisted even when the atrophy was complete; nearly three months after the injury, the development of a ciliary staphyloma,

up and out." The author then discussed cases of glaucoma following trifling injuries, making special reference to the cases reported by Drs. Priestly Smith, Lundy, Brailey, Ferber, Knapp, and Garnier and says: "The evident conclusion of the whole matter is this,—that in these cases of traumatic glaucoma, setting aside for the moment those which cause the typical secondary variety of the disease, the lesion, so far as we may judge from microscopical examinations is similar to those which we find in the primary variety of the affection. These cases further indicate the necessity of keeping under observation patients who have suffered from the blows on the eye, even when all external manifestations have passed away, because there may develop a glaucoma which if neglected results in blindness."

The Roentgen Rays in Ophthalmic Surgery.

DR. H. M. HANSELL, PHILADELPHIA.

Dr. Hansell reports two cases of his own in which a foreign body was located by use of the X rays and reviews the cases heretofore reported by Drs. Clark, Williams, Thomson, Oliver and de Schweinitz. His method is simply to bandage a photographic plate to the side of the head and arrange the Roentgen tube in front of and to nasal side of the eye and at an angle of 45° and about 14 inches distant. He believes that in the use of the X Ray we have an accurate, reliable and speedy method of establishing the presence or absence of foreign bodies in the eyeball.

The Roentgen Rays in Ophthalmic Surgery.

DR. W. M. SWEET, PHILADELPHIA.

Dr. Sweet offers a special apparatus for taking the skiagraphs. It consists of two metallic points to be placed in front of the eye at a known distance from the cornea and from each other and a plate holder to be held at the side of the head; the whole is fastened together and held on by a head band. The Crookes' tube is placed in horizontal line, with the point which is opposite the centre of the cornea to the nasal side and about thirteen inches from the eye. A second picture is taken with the tube placed at a point below the metal points or indicators. From these two pictures, having the known distances of the indicators from the eye and from each other, the exact location of the foreign body can easily be calculated. Dr. Sweet finds by experiment that the bony walls of the orbit do not offer much obstruction to the X-rays; that the small focus point tube is to

be preferred for this work; that very minute bits of metal can be discovered; that ordinary landscape plates are all that is needed and that the exposure may not be more than four minutes.

Dr. C. F. Clarke, Columbia, Ohio, spoke of the first case he reported, in which it seemed possible to locate the minute piece of metal only by holding the plate at the internal angle of the eye. The eye was saved. He referred also to accidents resulting from use of the Roentgen Rays and recorded a case in which the hair had fallen out over the exposed region and when it grew out again was found to be white. These accidents do not appear to be the result of any particular form of apparatus and no known precautions will prevent them in a certain number of cases. Dr. Clarke has tried inserting plates into the nasal cavity, but does not know as yet whether it can be used long enough to get a good picture.

Dr. M. J. Stern, Philadelphia, advocated the simplest method of taking these pictures, that of simply bandaging the plate to the side of the head. He said the time of exposure he has been able to reduce from forty minutes to one-half minute and finds the latter time quite sufficient. He places the light at eight inches from the face, because he has found better defined pictures by that means.

Dr. Lucien Howe, Buffalo, exhibited some photographs which were taken in an attempt to determine the relative opacity of different media of the eye. The lens was found to be the most opaque.

Dr. Hale, Chicago, reported a case of a girl who had had discission performed on one eye for high myopia. A photograph was taken to determine if possible why the vision was so poor. An opacity was shown in the position of the lens and encouraged to believe that possibly some remaining cortical matter was blocking the vision, a thorough discission was done. The ophthalmoscopic picture was improved, but the vision was not.

Dr. Alling, thought the subject was of great scientific interest but that it is practically applicable to only rare cases.

Dr. Lippincott, Pittsburg, Dr. William Thomson, Phila., and Dr. de Schweinitz, Phila., each reported cases in which the X-rays had been used successfully.

In What Cases Should We Enucleate in Injuries of the Eye?

Dr. J. M. Foster, Denver.

Dr. Foster concludes that serious thought should be given to the operation in penetrating wounds of the ciliary region, but we should

not operate for every ciliary wound. Enucleate regardless of the situation of the wound in cases where there is marked inflammation of the injured eye and photophobia in the other; also when panophthalmitis is threatened. In panophthalmitis an early enucleation should be done for fear of meningitis, following. The time to enucleate is as soon as possible after deciding that it is necessary.

The Electro-Magnet of Haab in the Removal of Pieces of Steel From the Interior of the Eye,

Dr. J. E. Weeks, New York.

Dr. Weeks gives a detailed description of Haab's giant magnet and then relates three cases in which he used it. In the first case a piece of steel had pierced the fibrous coat at the limbus, passed through iris suspensory ligament and lodged in the vitreous humor, not injuring the lens. "Under cocaine anaesthesia the prolapsing iris and vitreous were excised, the wound was enlarged, by continuing the incision on the limbus above and below, 2 mm at each end, and by making an incision 2 mm long through the corneal tissue at right angles with this, the whole forming a + shaped wound. The patient was then approached to the sterilized point of the great magnet, and when the eye was within about 4 mm of the conical end of the magnet, the piece of steel flew from the wound and adhered to the magnet. The pillars of the coloboma were replaced, the margins of the wound adjusted and the patient recovered with V. = $\frac{20}{30}$ plus. In case 2, a bit of steel 4 mm in diameter had passed through the cornea, iris, zonular margin and lodged in the vitreous. It was successfully removed in like manner. Case 3 was not so favorable. The foreign body a piece of iron 6.5 mm by 1 mm had buried itself in the sclera beside the optic nerve and it became necessary to enucleate. Dr. Weeks thinks the instrument is not only of value in such cases, but is of service in diagnosticating the presence of metallic substances in the globe as it causes pain in the region of such a foreign body, when the eye is presented to the action of the large magnet.

Discussion.—Dr. Gifford said he had one of the magnets and the greatest difficulty he had was in keeping a satisfactory supply of electricity at hand to run it. He had never succeeded in bringing out a foreign body with it, but, in some cases, he had obtained useful information from its use.

Dr. Knapp thought it was a very useful instrument if you did not have to go into the vitreous for the foreign body, because if you did,

though the immediate result might be good, the final one would not be.

Dr. Lippincott spoke of the disadvantage of the instrument's not being portable. The one he had was worked by connection with the street current. He had removed five foreign bodies from various parts of the eye and had besides found it of value in a diagnostic way.

Bacteria in the Normal Conjunctivae and the Effect Upon Them of Aseptic and Antiseptic Irrigations.

Dr. R. L. Randolph, Baltimore.

Dr. Randolph concludes: that the normal conjunctiva always contains bacteria. It is probable that the bacteria found in this locality are usually of only slight, if any, pathogenic character. It should be remembered, though, that bacteria ordinarily nonpathogenic may become harmful under certain conditions. (2.) Neither irrigation with sterilized water nor instillation of sublimate solution (1 to 5,000) produce sterility of the conjunctiva and inasmuch as both measures are futile and possibly harmful they may just as well be abandoned. (3.) In operating on the normal conjunctiva, as in cataract operations, the surgeon in the present state of our disinfecting armamentarium would do well to consider the subject of antisepsis and asepsis chiefly if not solely in connection with his hands and instruments, and of course, the cocaine and atrophine."

Discussion.—Dr. Gifford agreed with Dr. Randolph in the greater part of his conclusions, but criticised the method employed in some of his experiments. He spoke of the almost impossibility of sterilizing the conjunctiva and stated that in using antiseptics sufficiently strong to do this we run a risk of doing more harm than good, by irritation of the tissues.

Dr. Weeks thought it would be unfortunate for the impression to go out that we must forego all attempts to render the conjunctival sac as clear of bacteria as possible. He thought it advisable to make it as clean as we can.

Dr. Burnett regretted that Dr. Randolph had not extended his investigation to a study of the lashes and lid margin.

The Best Methods of Sterilizing Ophthalmic Instruments and Solutions of Myotics and Mydriatcis.

Dr. E. A. de Schweinitz, Washington, D. C.

The author considers formaldehyde the best agent for sterilizing both instruments and solutions. In the latter case he has found

solution of 1 to 5,000 to answer perfectly. In case of the instruments the problem is to sterilize without blunting the cutting edge or the tarnishing instrument. He has found that 1 to 1000 solution of formaldehyde used for ten minutes here answers these requirements, but he prefers even to this the use of pure formaldehyde. This is obtained by placing in a tight box or oven, a small dish of formaldehyde to which a small bit of calcium chloride is added. This results in generation of the gas. The instruments should be washed, dried and placed in this gas box and they will be sterile within ten minutes but no harm is done if they remain for hours.

Discussion —Dr. Burnett indorsed all that the author had said, as he had had the pleasure of seeing the experiments. He said that it seemed possessed of all the essential qualities of a perfect disinfecting subject and had no toxic properties. Formaldehyde is the ideal germicide, and the experiments of Dr. de Schweinitz have proven their value in disinfecting instruments beyond dispute.

Primary Sarcoma of the Iris: A Statistical Study, with Report of a New Case.

Dr. C. A. Veasey, Philadelphia.

Dr. Veasey reported a case of small round-cell sarcoma, situated in the upper inner quadrant of the iris of left eye. The patient was a male, 46 years old, and the growth was successfully removed by a broad peripheral iridectomy. The report is accompanied by an interesting history of the case and the report of the pathologist of the microscopic appearances. An abstract report of 46 cases operated upon by various surgeons is then given and tables arranged to show the ages at which the growth occurred, situation, etc.

Certain Anomalous Conditions of the Iris.

Dr. William Campbell Posey, Philadelphia.

The author reported a case of partial irideremia or aniridia and offers the following hypothesis regarding the genesis of such cases: "We know that the root of the iris, i. e., the marginal portion of the secondary optic vesicle from which the iris springs, is essentially a vascular tissue, consisting of but little more than a network of blood vessels supported on a delicate connective tissue, which is derived from the endothelial layer and a few spindle cells from the anterior layer. The vessels are formed through the reunion of the long and anterior ciliary arteries, which anastomose to form the major circle of the

iris. From this circle small branches are given off which run inwardly between the cornea and the lens and represent the chief blood vessels of the iris. Each of these vascular groups is surrounded with connective tissue cells which become the stroma of the iris. These vascular twigs, with the proliferating cells about them, protrude into the anterior chamber and viewed at this stage would represent to my mind, a segment quite analogous to those which have been referred to, and if the process of development stopped here, we have an appearance similar to that noted in my case, i. e., a number of more or less isolated roots or segments. Later a union of these segments occurs and the complete iris is formed. If these segments represent, as I believe, the proliferation of tissue around the twig of the major circle of the iris, then the explanation of many forms of anomalies of the iris would be a simple matter. Suppose some slight irregularity in the proper distribution of one of the twigs—corectopia would result ; suppose one of the twigs entirely absent — coloboma is explained ; suppose a long ciliary artery were absent, we would have a coloboma of the iris that also involves its root, the ciliary body and perhaps the choroid as well.''

The Present Status of Jequirity in the Treatment of Trachoma.

Dr. W. Cheatham, Louisville.

Dr. Cheatham believes that in the treatment of trachoma, weak solutions of jequirity are powerful stimulants and absorbents, and he also believes in the application of the powder directly to the parts, but he does not advocate the original method of using it, i. e., the production of violent inflammatory conditions.

Ten Years Experience with the Surgical Treatment of Trachoma.

Dr. H. Gifford, Omaha.

The author insists that no one of the various surgical methods is applicable to all cases of trachoma. Expression, excision, burning, scarifying, and curetting, each is of service in particular conditions. Expression should be accomplished by going over the folds (and tarsi where the latter is infiltrated) with some form of forceps, several times, with a gradually increasing pressure. Where extensive surfaces have been denuded of epithelium by the operation, adhesions between different parts of the folds can be largely prevented by keeping each lid everted for 24 hours by two sutures passed through the edge of the lid and the skin of the cheek or brow, a moist dressing well coated with

sterilized white vaseline being applied. After slight excisions of the folds no suture is necessary. After extensive excisions, including part of the tarsus, a continuous suture with the terminal knots left on the skin-side of the lid is used. For the author's expression forceps, see the original. Cases of cicatricial trachoma, excluded by many from surgical treatment, can be benefited by proper surgical removal of the slight but still active trachomatous foci which are always present. In spite of surgical measures, medical applications, in addition, are nearly always required, and in the hands of those not well versed in the treatment and diagnosis of corneal and conjunctival affections should be used to the exclusion of surgical measures.

Statistics of Cataract Operations, with Comments.

Dr. H. Knapp, New York.

Statistics may be made from different points of view. To present a faithful picture of what an operator has accomplished all his operations should be included, even if he places in an appendix a portion of them. What constitutes success and failure? We usually measure these by the visual result, and yet the surgeon is entitled to credit when the operation has gone smoothly and when, in the nature of things, little or no sight remains. It may be designated *an operative success.* It must not be assumed that good vision will result because it is the belief of the operator that the patient will have useful vision after a discission—he must have actually secured the result.

"By means of my last 400 cases of extraction, which include every instance of extraction in my experience from Sept. 19th, 1894, to May 19th, 1897, I propose to illustrate (1) *the complications of cataract, their nature and treatment, with final results.* 57, or 14.25 per cent. showed: *Diabetes* in 6 cases, 5 smooth, 1 protracted recovery. *Albuminuria*, 2 cases, both good recoveries. *Gout*, 1, with good result. *Insanity*, 3 cases, 2 failures. *Rheumatism*, 1 case, good. *Chronic bronchitis*, cough, 2 cases, 1 good, 1 failure. *Traumatism*, cases, good. *Foreign body in lens*, 1 case, good. Chronic dacryocystitis, 6 cases, 3 good, 3 failures by suppuration. *Excessive myopia*, 4 cases, good. *Synchisis*, 3 cases, good. *Choroiditis*, 3 cases, smooth recoveries. *Chronic irido-choroiditis*, 8 cases, 7 satisfactory and 1 failure. *Maculae corneae*, 4 cases, good. *Chronic glaucoma*, 3 cases, smooth recoveries. *Optic nerve atrophy*, 2 cases, recoveries good. *Congenital nystagmus*, 1 case, good. *Chalky lens*, dislocated into

anterior chamber, good operative result. *Syphilis*, 1 case, good. *Extractions with iridectomy* were made in 56 cases, or 14 per cent. I was induced to do this among the 400 series in 9 instances on account of *tendency to iris prolapse;* in *glaucoma*, 2; diabetic retinitis, 1; albuminuria, 1; *insane*, 1; profuse hemorrhage into anterior chamber, 2; *unmanageable patient*, 8; *iris fell over knife*, 5; *rigidity of iris sphincter*, 1; *loss of vitreous*, 1; *no reason stated*, 5; *peripheric section*, 2; *synchisis*, rupture of ligament, lens tremulous or dislocated, 9; *iritis, irido-cyclitis* and *irido-choroiditis*, 5; *bruising of iris*, 1; splinter of wood in lens, 1; to remove thickened capsule, 1. Of these 56 cases 15 secondary operations were done. The final results were: V. = $\frac{20}{200}$ to $\frac{20}{20}$ in 43; moderate, $\frac{3}{200}$ to $\frac{18}{200}$ in 6 instances.

Reactive Processes.—Mild iritis, 6 cases, with good results. *Protracted irido-cyclitis*, 2 cases, ending in $\frac{1}{200}$ and $\frac{1}{60}$. *Post-operative hemorrhage into anterior chamber*, good. *Slow closure of wound.* V. = $\frac{20}{40}$. *Partial infection of wound*, 2 cases. V. = $\frac{20}{200}$ and $\frac{1}{60}$. *Total suppuration*, 4 cases, V. = 0 in all. *Anterior Synechiæ*, a goodly number of *small adhesions to the scar*, not interfering with vision or healing. One ended in glaucoma. *Prolapses of iris*, 26 cases (7.6 per cent.), mostly occurring the first night, abscised as soon as discovered, examining the eye daily. Visual results were good in every instance, except one where cough was present.

There were 160 *after operations*, 40 per cent.: *Enucleation*, 1 case for unrelieved glaucomatous irido-choroiditis. *Iridectomy* in one case of glaucoma following extraction and in three following discission. *Extraction of thickened capsule*, 2 cases.

Discission, 153, or 38 per cent., with marked improvement of vision in all but a few instances where V. remained as before. Glaucoma followed in 4 cases. On the repetition of the operation in one of these cyclitis set in, but was checked by the iridectomy and excellent sight was regained.

The visual acuity was as follows: $\frac{20}{200}$ to $\frac{20}{20}$, 35 cases, or 90 per cent., good results; $\frac{1}{200}$ to $\frac{18}{200}$, 29 cases, 7 per cent., moderate; failure in 12 cases or 3 per cent. The usual results of the previous 600 cases (not before published) were as follows: Good vision, 572, or 95 per cent.; moderate, 16, or 3 per cent.; failures. 12, or 2 per cent. The second series showed somewhat better results, but 30 cases, or 5 per cent., were, in addition, omitted as offering too poor a prognosis. These should be considered in comparing the two series. Adding the two

together we get good vision in 93.1 per cent., moderate vision in 4.5 per cent., and failure in 2.4 per cent.

Prolapse of the iris occurred in 55 cases (10.3 per cent.) out of 548 in the first series of simple extractions. In the second, 26 cases occurred in 343 cases, or 7.67 per cent. There were 81 in 891 simple extractions, or 9.1 per cent. Of the 55, 49 got good vision, 2 moderate. Two lost sight in the eye operated upon and two lost sight in the opposite eye from sympathetic ophthalmia. This rare complication occurs when the iris is wounded and happens oftener in the combined than in the simple operation. *Secondary operations* were performed in 66 per cent. of the first series and in 44 per cent. of the second.

Shot-grain Wounds of the Eye.

Dr. L. H. Taylor, Wilkesbarre, Pa.

Dr. Taylor reports three interesting cases of gunshot wounds of the eye, in all of which he succeeded in saving the eye, and in two of them there was useful vision. He considers the question as to why these wounds seem to be less dangerous than other penetrating wounds of the globe, and concludes: "1st. That gunshot wounds of the eye are less dangerous than wounds of similar severity from many other causes. 2nd. That in general an eye wounded by gunshot grains, unless the wound be one of unusual severity, should not be immediately enucleated, but should be treated conservatively under observation. 3rd. A patient with a wound of this character should rest in bed for a period of two weeks or more, and the wound be treated under the most rigid antiseptic precautions."

Discussion.—Dr. Kollock spoke of the fact that gun-shot may pass entirely through the eyeball and remain in the orbit without giving much trouble. He said that if the shot remained in the eye there was not apt to be ecchymosis of the lids as would occur if the shot was in the orbit.

Dr. Casey Wood said that some years ago he had reported a series of these cases in the *American Journal of Ophthalmology*, and had come to nearly the same conclusions as Dr. Taylor. "I then advanced the idea that shot grains were probably aseptic at the time of penetrating the eyeball. It seemed to me that the friction of the shot in passing through the air rendered them sufficiently aseptic to account for the condition that occurs after the trauma.

Dr. Randolph believed that Dr. Wood had really explained the matter and called attention to the experiments of Le Garde and men-

tioned the negative results he had obtained on firing into culture media.

Dr. Gifford called Dr. Randolph's attention to the fact that the same investigator also reported a number of positive results, and that the conditions surrounding the ordinary bird shot were different from those of the bullet in the smooth bore rifle. He thought the chemical properties of the shot more important than the asepsis.

The Implantation of a Glass Ball for the Support of an Artificial Eye, and Mules' Operation for the Substitution of Enucleation of an Eyeball.

Dr. L. Webster Fox, Philadelphia.

My method of performing implantation is as follows: After incising the conjunctiva and tissues of the orbit in the horizontal direction, corresponding to the diameter of the glass ball to be inserted, the upper lip of the conjunctiva is raised, and with a sharp-pointed, curved scissors the conjunctiva and sub-connective tissue that lies close to it is dissected off in all directions, making a pouch into which the glass ball will fit. On account of the vascularity of the parts, considerable bleeding follows this dissection, but it is easily controlled by pressure. The glass ball is then inserted into the cul-de-sac with the injector. The edges of the conjunctiva are brought together by five or six stitches. Experience has taught me that it is well to keep the pressure bandage over the orbit from 48 to 72 hours.

The method of performing Mules' operation is this: The eyelids are separated with the ophthalmostat. The conjunctiva is dissected off from its corneo-scleral attachment back to about the equator of the eyeball, the muscles are also separated; then the cornea is excised. This is best done with a large Beer's knife, as if performing a flap operation for cataract; the lower half of the cornea is removed with curved scissors and the contents of the globe are taken out with a small scoop devised for the purpose. Great care is necessary to remove the ciliary body and choroid and head of the optic nerve, leaving a clean white sclera. The cavity is then packed with sterilized gauze to prevent hemorrhage, and when after a few minutes this is removed the cavity is thoroughly irrigated with antiseptic fluid. A sterilized glass globe is then inserted with a specially devised instrument. The sclera is split vertically so that the edges may be drawn together and held by

stitches of No. 4 black silk, completely hiding the glass ball. As a rule, the conjunctival sutures are not removed until six or ten days.

The total number of operations performed up to the present writing number 82, and so far as I have been able to keep trace of them no serious results, such as sympathetic irritation, or meningitis, have followed. I may say, like Brudenell Carter, "That I am performing this operation with increasing pleasure on every available occasion."

Discussion.—Dr. Allport said that from his experience he thought this operation had come to stay and that we could not disregard its improved cosmetic effect. His operations had all resulted favorably, his greatest difficulty having been in obtaining satisfactory artificial shells after the operation.

Dr. Risley—"I am convinced that this is not only a justifiable and highly interesting operation, but one to be commended in prudently selected cases. In a large number of patients the operation presents many advantages over enucleation." His technique differed slightly from that of Dr. Fox.

Dr. Thompson was inclined to favor the old conservative operation.

Dr. Pick read a paper in which he related some experiments upon rabbits to show that rubber balls might be used instead of the glass ones.

Dr. Prince suggested that the silver ones might be better because of the fact that in the presence of granulation tissue they would become coated with silver lactate, which is a good antiseptic.

Drs. Ring, Friebis and de Schweinitz each gave testimony favorable to Mules' operation.

A Report of Thirty Cases of Cataract Extraction with Reference to the Treatment of Prolapse of the Iris in Simple Extraction.

DR. L. F. LOVE, PHILADELPHIA.

The writer is of the opinion that the adoption by modern ophthalmic surgeons of strict asepsis and antisepsis, where necessary, has made simple extraction of cataracts more popular at the present day. The great drawback being the danger of prolapse of the iris, which the most skillful surgeons acknowledge to happen in from six to eight per cent., led to inquiries being made of a number of prominent

surgeons both in this country and in Europe. The consensus of opinion was that the prolapse should be cut off as soon as discovered, that is, if discovered in the first two or three days. If the prolapse be small and does not appear until later it is allowed to remain. Dr. Love is of the opinion that prolapses are frequently caused by the failure of the surgeon to thoroughly remove all cortical matter, and especially dangerous is the clear cortical matter. The paper enters into detail as to the management of the cases before and after operation and gives a list of thirty cases, twenty of which were done without iridectomy.

Treatment of Glaucoma.

Dr. Dudley S. Reynolds, Louisville.

The conclusions of the author are as follows:

(1). Incipient glaucoma is frequently relieved by improved nutrition, with correction of any existing errors of refraction; it is sometimes relieved by the iodide of potassium, associated with the local use of eserin drops. (2). Mild and insidious cases of inflammatory glaucoma, between paroxysms, may exhibit but little tension. They require iridectomy for the drainage of the engorged vessels during the paroxysm, and constitutional treatment to aid in the elimination of accumulated debris in the tissues. (3) Inflammatory glaucoma, excluding the traumatic cases, should be accepted as a manifestation of many diatheses; and, whilst iridectomy should constitute a necessary part of the treatment, it should not be done to the exclusion of the all important constitutional measures. (4). Since iridectomy can accomplish nothing beyond the establishment of drainage for the vessels of the iris and contiguous structures into the aqueous chamber, the amount of iris removed should be small. The operation should not be repeated and, in any case, supplemental constitutional treatment is imperatively demanded. (5). In all cases of increased tension of the eye with peripheral contraction of the field, engorgement of the retinal veins, with or without cupping of the disk, constitutional treatment is necessary, and, above all, strict attention to the general nutrition and habit, of the patient.

Secondary Glaucoma.

Dr. S. D. Risley, Philadelphia.

Dr. Risley gave "the history of two cases which illustrate widely diverse types of disease, each leading up finally to the symptom-group we call glaucoma." Case 1.—Plastic irido-cyclitis; annular synechia

and occlusion of pupils; secondary glaucoma; iridectomy; recovery with moderate vision. Case 2.—Uveitis—secondary glaucoma. It is obvious that from start to finish we have two essentially different types of disease portrayed in the history of these two patients, but, nevertheless, culminating in a common group of symptoms depending upon a mechanical condition which required for its relief the same mechanical interference. In case 1 the increase of tension was due to the exudate and fluids imprisoned behind the iris and by the closure of the angle of the anterior chamber. In case 2 it is probable that the anterior excretory channels were clogged by the profuse albuminous exudate. The disease first manifested itself in and around the papilla and spread forward, gradually manifesting all the conditions ordinarily present in so-called sympathetic ophthalmia of the serous type.

Discussion.—Dr. Hotz discussed the theories of glaucoma and said that he considered the work of Treacher Collins as of the greatest importance. He thinks that the ciliary processes are glandular structures, and if these observations are confirmed we have a very important discovery.

Dr. Allport criticized the position taken by Dr. Reynolds, particularly in reference to the connection between glaucoma and the gouty diathesis.

Dr. Casey Wood related a case of secondary glaucoma following traumatism.

Dr. Connor defended the position taken by Dr. Reynolds and considered the manner in which improvement was brought about by iridectomy.

After Treatment of Cataract with Special Reference to the Use of Germicides.

Dr. J. A. White, Richmond.

Dr. White is of the opinion that the eye will get along best with the least possible interference during the ten days immediately following the operation. The best way to keep the eye at rest is by a properly adjusted packing of sterilized gauze, or absorbent cotton over both eyes, held in place by a bandage of strips of plaster, and by confining the patient to bed. The best way to prevent injury to the eye is by a protective mask. The author considers the possibility of a sterilizing the conjunctiva and says that he is "in the habit of using sterilized vaseline before and after the operation. The vaseline is boiled ten minutes and to each ounce is added 1/6 gr. of bichloride of mercury and an equal

quantity of chloride of sodium, well rubbed in while cooling. Twenty-four hours prior to the operation the eye is thoroughly washed with a sublimate solution, 1 to 5,000, filled with sterilized vaseline and sealed with antiseptic dressing. This is removed on the operating table just before extraction. During the operation the eye is flushed with sublimate solution, 1 to 5,000, and as soon as it is completed is filled with the vaseline and dressings applied. In regard to subsequent dressings I find that some change them every day and others more seldom; some not at all during the first week. It would seem that more than one road leads to Rome. If prolapse occurs immediately after the operation, I think it is better to do a regular iridectomy at once because if returned it usually prolapses again, but, if it be not discovered until the first removal of the dressing, my experience is that it had better be let alone. If infection of the wound occur I know of no sure way of preventing a bad result."

Best Methods of Preparing Dressings for Cataract Cases, and Their Character and Composition.

Dr. Casey A. Wood, Chicago.

I must confess that I feel very much like dissenting from the proposition implied in the title given to this communication, because I am in considerable doubt as to whether there is any *best* method of preparing dressings for the average cataract case. My own experience and the results that I know others to have obtained, teach me that when a cataract extraction has been deftly and completely accomplished, when the lips of the corneal wound have been carefully approximated and when no intraocular debris rests between the latter—when, in other words, the operation leaves nothing to be desired the dressing is of little or no importance. In such a case it is of no moment whether the lids be simply closed with a strip or two of isinglass plaster or whether the eye be subjected to the elaborate toilet recommended by many distinguished writers and teachers. If the operation be correctly done, it matters not whether the dressing be negatively aseptic or positively antiseptic. If, however, the operation fails in any one of these important particulars, the question may well arise as to what description of dressing is most likely to assist repair of the surgical traumatism, by preventing extra ocular infection of the wound and by favoring apposition of the margins of the wound. The first indication is probably best met by some covering for the eye that, while not entirely excluding ventilation, will be sufficient to prevent the

entrance of morbific germs and irritating dust. It should also be sufficiently absorbent to take up the tears and mucus that commonly flow from an eye that has been recently operated upon. I have been unable to convince myself that a dressing impregnated with germicides of sufficient power to destroy any pathogenic organisms that have lodged in and about the eye does not do more harm than good. No dressing should be depended upon to do the work of sterilizing the conjunctival sac, lids or lid edges. If this be attempted, the hyperaemia which the bactericide generally sets up is, at least positively harmful in the great majority of cases. What good purpose is subserved by the attempt, so often made, to keep the corneal margins *in situ* by the use of bandages and other appliances? You are all well acquainted with these devices—the little rolls of cotton (aseptic and antiseptic), the simple roller, starch bandages and other appliances of a similar nature. I have tried and discarded all of these as I have found them entirely unnecessary in uncomplicated cases of extraction and never saw any good come from their employment even when in times of trouble, a mechanical support seemed desirable. In my hands sufficient protection from external irritants combined with an effective provision for the absorption of post-operative discharges may be secured by the following dressing; carefully sterilized and rolled in a sterilized towel until the moment of application. It is far from being original with me. A sheet of well prepared cotton, 4 mm is placed upon two thicknesses of simple moist gauze and these are together cut so that when placed upon the eye their circumference overlaps by 5 mm, the irregular circle of the orbital margins. Three strips of adhesive plaster, 2 cm wide and 10 long are made to hold this dressing in place, in such a fashion that none of the cotton or gauze projects beyond the edges of the plaster. The strips form a triangle one side of which runs parallel or almost parallel with the nose, the base corresponds to the supraorbital ridge and the third joins the unattached ends of the other two. Such a dressing filters the air passing to the eye, of its germs and dust; it is comfortable to the patient, does not press upon the eyeball and readily absorbs lachrymal and other secretions. It does not, like the roller, starch and antiseptic bandage encourage vascular congestion and, finally it may be impregnated or smeared with any agent that the surgeon cares to apply. Neither the patient nor his officious friend is at all likely to succeed in removing it, although the surgeon may examine and drop collyria into the eye by simply detaching and raising the lower point of the triangle. What

can be more provoking to the surgeon than to find, after obtaining a good operative result, that a careless nurse or a restless patient has added a newly opened corneal wound, a hernia of the iris, or loss of vitreous, to his other anxieties? A finger thrust, a pillow-end jammed into the eye, a slight blow upon the globe, or any other of the dozen little accidents that happen to a person with imperfect vision moving about in darkened rooms, may nullify the most brilliant and correct efforts of the operator.

Especially when night comes on, or when the patient begins to move about, the eye should be protected from injury by some sort of a shield or mask. Fuchs uses the wire-woven protector, introduced as long ago as 1883. There are many modifications of this mask in the market, one of the best of which has been suggested by Frothingham & Würdemann. Certain operators who make use of the roller bandage gain protection by starching the dressing. When this has dried, the eye will receive a considerable blow without injury. Snellen has lately used a turtle-shaped aluminium shield, about ten centimeters long and five wide, placed over the eye and held in position with strips of adhesive plaster; it forms an admirable protector. One of the best shields I am acquainted with is the papier mache half-mask, which when carefully adjusted to the nose and surrounding parts makes a light, comfortable and effective protector. A small portion of the patients object to wearing any sort of mask, claiming that it prevents them from sleeping and makes them nervous. In such cases I find that one may very well get along with a large, stiff and very concave eye-shade placed over the dressing and held in place with piece of rubber plaster.

Discussion.—Dr. Knapp said that he considered the object of the bandage was to immobilize the eye, and that for this purpose there was none better than the old binoculus. He more frequently used, however, a pad of gauze and cotton, which was applied moist and held on by plaster strips. It adapted itself better to the lids when moist than if put on dry. After simple extractions he always examined the eye the next day, so that if there was a prolapse it could be readily cut off and the operation thus converted into a combined one.

Dr. Standish spoke of cataract extractions in cases where there was a blenorrhoea of the lachrymal sac and mentioned such a case in which he had used iodoform with great success.

Dr. Conner demonstrated a method of bathing the eye and lids, which consisted in filling a tumbler with hot water, bringing it close against the nose and by dipping forward immersing the eye.

Dr. Lippincott exhibited a small box which he had prepared for the purpose of sterilizing plaster.

Dr. Hotz announced that he was still in favor of bandaging both eyes after cataract extraction.

Angio-myxoma of the Orbit, with Report of a Case.

Dr. S. C. Ayres, Cincinnati.

Mrs. M., aged 64, was first examined by me in February, 1896. She states that the tumor in the right orbit was first noticed eighteen years ago. It began at the upper outer angle in the region of the lachrymal gland and its development has been very slow. It fills the upper outer portion of the orbit, pushing the eye out and down ; the proptosis being so great that the posterior portion of the globe is almost on a line with the bridge of the nose. The outline of the tumor can be made out on forcibly drawing up the upper lid. The lower lid was oedematous from pressure. The eye has never given any pain.

The outer commissure was severed and the adhesions around the tumor separated. The attachment of the growth was to the outer portion of the orbital wall. Its removal was accomplished without sacrificing the ball, but there was such excessive hemorrhage that it became necessary to enucleate it. Microscopic examination proved the tumor to be an angio-myxoma.

Cavernous Tumor of a Lid with Extensive Conjunctival Involvement.

Dr. G. Oram Ring, Philadelphia.

The patient, a female aged eighteen months, was seen with naevus of the right upper eyelid. At birth there existed only a small mark about the size of a pin-head which has gradually increased in size. It has been operated upon by another surgeon by the method of ligation ; in one week it sloughed off and the ulcer healed without difficulty, but a protrusion of the mucous membrane soon began and reached the condition presented when Dr. Ring first saw it, nine months after the first operation. The mass then involved the conjunctiva and extended well up in the retro-tarsal folds.

Electrolosis has been tried five times, but with very slight success. The application of ethylate of sodium as suggested by Snell is being tried now.

Discussson.—Dr. Weeks spoke of the nature of these cavernous angiomas as being usually sarcomatous and said that he followed the

advice given him some years ago by Dr. Knapp to remove them thoroughly and as soon as possible.

Melano-Sarcoma of the Conjunctiva, with Report of a Case.

Dr. A. R. Baker, Cleveland, Ohio.

Mr. G., aged 69, first seen in '88 with a dark purplish, lobulated tumor of the left eyeball about three-quarters of an inch in length, one-half in breadth and one-half inch in thickness, springing from the ocular conjunctiva on the nasal side. The tumor had first been noticed one year previously. There was no history of traumatism. The tumor was large enough to prevent rotation of the eye to the right and hence there was no diplopia when looking in that direction. The tumor increased rapidly in size and a few months later patient consented to operation. A formidable operation was anticipated, but the tumor proved to be pedunculated and very superficially attached to the conjunctiva and hence was easily removed. Three years after the operation patient was in perfect health and vision perfect in both eyes. The tumor was examined microscopically and found to be a small-celled melano-sarcoma with much pigment. Five years after the operation the patient died with cancer of the liver.

The Relative Infrequency of Trachoma in Southern California.

Dr. H. Bert Ellis, Los Angeles, Cal.

This inquiry was sent to the leading eye men of the southern part of the State: "In your ophthalmic practice have you observed trachoma frequently? In about what per cent. of your cases?" Every one replied that trachoma was relatively infrequent in this section of the country. The percentage averaged from one to two per cent. In my own practice, extending over a period of eight years, I have had less than one per cent. of trachoma, including both my private work and college clinic. Why it should be so I do not know, but the following facts may throw some light upon it. We have a cosmopolitan population, but mostly Americans. In no part of our state are the inhabitants crowded. The great bulk of the population lives within twenty-five miles of the ocean and at an elevation of less than a thousand feet. The climate is such that an outdoor life is the rule, and this fact with a relatively good sanitary condition helps to render our poorer citizens comparatively healthy, and they are enabled to resist, or rather they are rendered less susceptible to contagion of any kind.

The Surgical Treatment of Trachoma, with Special Reference to Expression and Grattage.

Dr. J. E. Weeks, New York.

Dr. Weekes described the method he had found most useful as follows: "All operations for marked trachoma are done under general anæsthesia. Cocaine is not sufficient, and if used results in giving the patient unnecessary pain and unduly hastens the work of the operator. The margin of the lids, after thorough cleansing, are turned over roller forceps to expose the whole surface of the conjunctiva. With a scarificator bearing three Demarres blades superficial incisions parallel to the margins of the lids are made in the trachomatous tissue; the contents of the follicles are then evacuated by a gentle stripping motion with a Noyes' or Knapp's forceps. A solution of bi-chloride, 1 to 500, is then applied by means of a moderately soft tooth brush, and the conjunctival sacs are irrigated by a solution of bi-chloride, 1 to 5000, and finally an ointment of bi-chloride in vaseline, 1 to 5000, is applied to the conjunctival surfaces. The eye is bandaged and left for twenty-four hours, and on removing this a layer of plastic lymph will be noticed over the conjunctiva, and there will be a tendency to adhesion between the layers of conjunctiva that oppose each other. Cocaine is applied and all adhesions broken up by means of a probe without disturbing the lymph layer any more than is necessary. This membrane is cast off in a few days, showing a very satisfactory condition of the conjunctiva. The advantages that this method possess are: first, the easy removal of the trachomatous tissue; second, the thorough antisepsis without deterring the healing process; and third, recovery with a smooth surface and with a minimum of contraction."

A Comparison of the Value of Local Medicinal Measures in the Treatment of Granular Conjunctivitis (Trachoma).

H. V. Würdemann, M. D., of Milwaukee, Wis.

The author in order to scientifically discuss local applications shows that the diseased process should be considered. The alteration of the epithelium is the only constant anatomico-pathologic phenomenon, the stages of its destruction should be noted in the treatment of the various processes coming under the head of trachoma or granular conjunctivitis.

1st. stage. Epithelial proliferation with a catarrhal condition due to hyperplasia and increased function. Treatment is detergent and antiseptic.

2nd. stage. Superficial destruction of epithelial elements, which may be reproduced by reorganization. Treatment applicable to this stage, removal of hyperplastic tissue, together with absorptive, stimulative and antiseptic measures.

3rd. stage. Total destruction of epithelium. The relief of sequelæ, complications and stimulation of remaining epithelium to aid in resorption of cicatricial tissue and regeneration of new epithelium.

4th. stage. The result of disease, Xerosis, an incurable condition whose symptoms are relieved by emollients.

The prophylactic, hygienic and constitutional measures are dwelled upon in a general way. The treatment is at first all directed toward removal of causes of destruction of epithelium, then to affect its regenmaeration. The removal of hyperplastic tissue and products of inflam tion by mechanical or surgical means if necessary, relief of asthenopic symptoms, complications and sequelæ. Under detergents and antiseptics, boric acid, bichlorid and cyanid of mercury are recommended in above order for patients' own use. Stronger solutions guarded by antipyrin, weak cocain, eucain or holocain are gratefully borne and useful. Ung. hydrarg. oxid. flav. and ung. ichthyol are stimulative as well as antiseptic. Brushing with nitrat of silver, bichlorid, lactic acid cause considerable reaction and stain the conjunctiva if long continued. Argentamin, cyanid of mercury and boroglyceride are free from above objections. Tannate of quinin, antipyrin and resorcin in solution or dusted on conjunctiva are antiseptic. In the acute inflammation, iced applications and cold bathing together with silver compounds are used. Congestion is limited by cocain, eucain or holocain with boric acid or sodii biborat. Under stimulants: Hot water bathing, with or without antiseptics and silver, mercury, copper and zinc compounds, not strong enough to corrode epithelium. Nutrition is increased by massage with ung. hydrarg. oxid. flav. Stimulation of nutrition may be effected by massage with impalpable boric acid, iodoform, calomel or aristol. Application of pumice stone, installation of crude petroleum, ichthyol, boric acid and resorcin, glyceride of tannin act as stimulants, as also do alum, copper, silver, lapsus divinus and ammonium muriat. Jequirity in weak solutions causes absorption by hyper-stimulation. Myotics and mydriatics are used in the complications such as pannus and ulcerative keratitis. Eserin acts as a stimulant, atropin as

a sedative, scopalmin and duboisin may be substituted. Massage with mercuric ointments or stimulating powders are most beneficial for sequelæ, causing absorption of cicatrices and leucomata. Most applications are better borne if a weak local anesthetic is used first. The application of silver salts should be followed by solution of sodii chlorid to prevent continued action. Strengths of drugs and methods of application are minutely described. The author lays a special stress upon massage with a *complete* eversion of eyelids so that fold of transmission is thoroughly exposed to view. The medical treatment, although tedious, is attended by gratifying results, but in most cases should be combined with surgical measures.

The Surgery of Trachoma.

DR. L. S. ZIEGLER, PHILADELPHIA.

Surgical procedures for the relief of trachoma are only indicated in the chronic stage of the disease and especially for the relief of the complications and sequelae. Without going deeply into the etiology of trachoma there is no doubt but that the essential elements in its persistence are the partial occlusion of the tear duct with consequent epiphora, the regurgitation of septic secretions, the perversion of the ocular secretions, the masceration of the cornea from the excessive amount of the secretion and discharge present, and finally friction from tarsal pressure with erosion of the corneal epithelium. The tear duct, even if it were not originally at fault, through participation in the inflammation and subsequent contraction, with a like perversion of the secretions within its lumen and the partial abolishment of its capillary action due to its thickened mucous lining and viscid contents, not only prevents the tears from passing downwards, but really adds to the trouble by the constant regurgitation of these septic secretions. The first object to be accomplished then is to secure a patulous tear duct by means of rapid dilatation, and without any incision of the tissues, as the latter only leads to subsequent cicatrical contraction. Then by the operation of canthoplasty to relieve the lids from friction and at the same time the tendency to masceration. Ordinarily no other treatment will be required if these two things have been performed thoroughly. For relief of the granulations themselves slight scarifying of the lid followed by the use of Knapp's roller forceps will usually accomplish all that is desired. The local treatment to be applied to the mucous membrane itself should be of a mild astringent character.

The Hygiene of Trachoma and the Relation of Altitude and Climate to its Development.

Dr. S. M. Burnett, Washington.

To establish efficient rules for the hygienic management of disease it is first necessary to have some definite ideas about its causation, the condition of the subject and the environments most conducive to its development. We have not yet arrived at the unanimous acceptance of the microbic origin of the disease. The most diligent research has failed to find a microbe which any considerable number agree upon as the bacteria of trachoma. Some hold that the disease is essentially one of the adenoid tissue of the conjunctiva. The facts that have been elicited from a systematic investigation of the prevalence of trachoma among different people shows such a disparity among them that we are compelled to consider race as an important factor in the establishment of a predisposition to the disease. With the acceptance of the theory of a dyscrasia as probably the essential character of the affection our ideas in respect to its hygienic management must differ somewhat from those based on the theory of a purely contagious nature. As however the idea of a dyscrasia has been considered seriously only within a very recent period our knowledge of the nature of the predisposition is as yet very limited. It must be borne in mind that here as in all cases of a supposed microbic origin, even with the acceptance of a dyscrasia, we have to consider not only the micro-organism but also the soil in which it grows. A large number of pathogenic organisms we have everywhere in the conjunctival sac in perfectly healthy eyes, organisms that if they were sufficiently numerous and the conditions for their growth favorable, would in a short time set up morbid processes. Heretofore we have been directing our attention almost entirely to the microbe and to the almost utter neglect of the soil on which it grows. The first law therefore in the treatment of trachoma and the prevention of it in those predisposed is the avoidance of causes which are likely to lead to such an inflammation. They should be kept apart from those suffering from any form of contagious ophthalmia, badly ventilated quarters should be avoided and such patients should be kept out of all forms of irritating atmosphere. The effect of climate has not yet been studied sufficiently to enable us to form a just estimate of its significance. As a rule countries bordering on the sea are less affected, probably because of the absence of dust. Altitude alone does ot give immunity.

The Treatment of Mal-position of the Lid Borders in Trachoma.

Dr. F. C. Hotz, Chicago, Ill.

Dr. Hotz says: "The first condition for a rational operation for entropium that we should insist upon is that we should always take into serious consideration the cosmetic effect of the operation. Every case can be rectified without the least mutilation. The second condition is that the most rational method of relieving the entropium is to remove those structural changes which cause the inversion. These structural changes begin in the anterior edge of the lid margin; the lashes first show a drooping, then a fold of skin just above their roots becomes lax, and later the orbicularis muscle, through repeated spasms, takes part in the dislocation. The following operation solves the problem here presented: The lid skin being put on the stretch an incision from canthus to canthus is made through the skin and muscle a little below the upper border of the tarsus. The skin and muscle is dissected from the tarsus down to the root of the lashes and the muscle fibers covering the upper border of the tarsus are excised. The lid skin is drawn up over the tarsus and fixed at its upper border by three silk or catgut sutures, which inclose within their loops the skin borders of the incision and the tarsal border and therefore when tied, close the original wound and establish a firm union of the skin with the tarsus. If the cartilage is so small that the incision has necessarily to be made very close to the ciliary margin it may be well to do a further operation, that of making an intra-marginal incision and filling the marginal wound with grafts of skin or mucous membrane; I prefer the former."

A Clinical Study of Hyperphoria.

Dr. J. T. Carpenter, Jr., Philadelphia.

The author makes a strong plea for the better classification of muscular abnormalities and for the study of their relation to the general diseases or to nervous disturbances. He offers the following classification which he has found to some advantage in his daily work as an aid to the clinical study of hyperphoria:

1. Spurious Hyperphoria, including:

A. Hyperphoria due to general disease—gout, etc.

B. Hyperphoria appearing in disease of the central nervous system.

C. Hyperphoria secondary to abnormal refractive or muscular states.

2. True Hyperphoria, including:

A. Concomitant.

B. Spasmodic.

C. Paretic.

He considers at some length and in an interesting manner the symptoms produced by the various conditions, and their causes, and concludes: "It is essential at the outset that a distinction should be made between true and spurious hyperphoria. It is absolutely imperative that before deciding upon any line of treatment for hyperphoria a careful and accurate examination of existing anatomic conditions should be made, which should include estimation of refraction, determination of tension of the extra-ocular muscles as indicated by their ability to overcome diplopia produced by prisms properly placed, measurement of the fields of vision, monocular and binocular, and the employment of all the tests which tend to remove the strong impulse to binocular single vision and reveal latent defects, such as the red glass, Maddox rod, etc. Treatment should be directed against the underlying causes after determining whether the defects be due to spasm, paresis or ocular over-action from anatomic conditions. Tenotomy is indicated only on muscles showing too great power. Advancement or muscular shortening in cases revealing weakness of a muscle, or, at least, no overwhelming power in its antagonist. There is urgent need for a more satisfactory classification of the entire subject of motor anomalies.

"Amblyopia Exanopsia."

Dr. A. C. Simonton, San José, Cal.

The writer reports a case of convergent squint with partial amblyopia, the vision being reduced to $\frac{8}{200}$ in one eye and $\frac{16}{60}$ in the other. The child was 8 years old and a tendency to squint had existed for three years. An over-correction of the hypermetropia was made and under the use of glasses vision which at the best when treatment began was only $\frac{16}{40}$ came up to $\frac{16}{16}$ within 3 months, and has remained so. Without glasses there is still a tendency to squint. He concludes from that and other cases that there is no doubt of the existence of amblyopia from disuse.

"Amblyopia From Suppression, Congenital Imperfection Or Disuse —Which Or All?"

Dr. Leartus Connor, Detroit, Mich.

Since different writers use the term "amblyopia exanopsia" to express radically diverse ideas, it is needful to define its meaning in this discussion. Negatively it is not applied to the dullness of vision induced either by an organic lesion, which can be objectively seen with the ophthalmoscope or otherwise; nor by exclusion of light from the retina, in part or whole, during long periods, nor by defective refraction or disturbed muscular equilibrium of either ciliary, rectus or oblique muscles. Positively it is applied to that dullness of vision which attends the inability of the brain to recognize impressions sent in from the retina. As to the nature and the causes of the dulled vision, we have three widely differing views. The first contends that the brain actively inhibits the visual center from receiving impressions until it loses its receptive power in whole or in part; the second says that the brain or visual center was not properly constructed; while the third argues that the phenomena result from the simple disuse, like the disability induced in other organs by a cessation of much or all of their functional activity during a considerable period. The relative importance of these views is of a practical nature. If we adopt congenital imperfection, it matters little whether cases of squint with amblyopia are operated upon early or late; whether the refractive defects be corrected at once or at convenience, the visual results will be the same. If the suppression be accepted, then it were criminal to delay in the rectification of those causes which are believed to induce the loss of sight lest the inhibitory power of the brain continue to the production of absolute blindness. If the amblyopia be regarded as due from simple disuse, then surely every consideration prompts to an immediate restoration of the fullest functional activity. Ophthalmological literature affords abundant authority in support of either of these views and of the practice based thereupon. In this state of the question a discussion by experts is of more than passing moment, and to secure such discussion from this section is the object of this paper."

After a consideration of all the points involved in this question, the author concludes:—

1. "There are undoubted cases of amblyopia from congenital imperfection; characterized by central scotoma, and unaffected by

any treatment; they are found in eyes that squint and eyes that do not squint, in the hyperopic, astigmatic, the anisometropic and in eyes free from one or more of these defects.

2. There is no positive evidence of the existence of amblyopia from suppression, viz, a loss of sight from the inhibitory action of the brain upon the visual center.

3. There is a class of cases often confounded with amblyopia characterized by lack of persistent vision rather than absolute loss; by the absence of scotoma; improved often by proper management; never congenital; found in all varieties of refraction and all sorts of muscular disturbance; having the same nature as diminished functional power of any sound organ from non-use or diminished use.

4. There is a class of cases in which a congenital amblyopia is still further crippled by disuse; in these proper management often produces satisfactory results in removing the latter factor.

5. It therefore remains good practice to study every case of amblyopia with or without squint at the earliest possible moment; correct its refractive defects and restore its muscular equilibrium because while we cannot repair the congenital imperfection we may remove the disability from disuse, and thus secure some improvement of vision.

Discussion.—Dr. Starkey exhibited a number of charts containing the history of patients he had treated all of which tended to show that amblyopia from disuse did exist and was often at least partially cured by bringing the eye again into the condition to work.

Dr. Thomas reported a case in which he had examined the eyes of a very intelligent child with perfect vision, had seen the same child some time later with a squint and developing amblyopia, and later still, after surgical treatment, the eyes had recovered perfect vision.

Dr. Johnson and Dr. Risley each referred to cases which they had published heretofore.

"Report of the Examination of the School Children's Eyes in the City of Minneapolis."

Dr. Frank Allport, Minneapolis Minnesota.

Dr. Allport reports some of the results obtained by the application of the plan of examination proposed by him more than two years ago and described the plan again, together with a few improvements that have suggested themselves from the practical use of the method. He has also recently adapted almost the same plan in the examination

of motor-men on street cars and engineers and firemen on railroads, modifying it of course to suit the special work done by these people. He has found in his city a considerable number of such employees unfit for their position and not only unsafe for the company to employ but a menace to the public safety.

Vicious Reading Distance a Cause of Asthenopia.

Dr. C. H. Thomas, Philadelphia.

J. J., a student aged 15, consulted Doctor Thomas October '96, wearing weak minus cylindrical lenses which gave vision of $\frac{6}{6}$ in each eye. No cause for change in the glasses could be found and no muscular error existed. The asthenopic symptoms however were very distressing and the boy was unable to keep up with his classes, having fallen two years behind those with whom he started. He did not suffer during vacation. It was found that he habitually held the book in reading at 7 inches, though he could read fine print easily at 13 to 15 inches. The 13 inch reading distance was strictly adopted and after one week the complete relief of the asthenopia was reported and this condition was continued.

"The Use of Full Correction Cylindrical Glasses in All Cases of Astigmatism."

Dr. L. J. Lautenbach, Philadelphia.

"I believe that the entire correction of the astigmatism present in every eye is a necessity, that is, provided the eye is used at all for near work. The refraction should be so adjusted that the ciliary muscle fibres act equally to produce a clear and distinct image upon the retina.

"Congenital Opacity of the Cornea."

Dr. Wendell Reber, Philadelphia."

"The fact that within the last 160 years but few writers have alluded to congenital opacity of the cornea would indicate either that the anomaly is comparatively rare or that it is infrequently reported. It is estimated to occur once in every 2,500 cases of ocular disease." In the case that follows the child was delivered by forceps and the eyebrow and lids were injured in the operation. When the swelling disappeared and the eye could be examined the greater part of the cornea was occupied by a bluish-white opacity. For some months there was no change in the appearance of the opacity, but now it seems to be slowly clearing up. After considering other cases reported and the

conclusions of others the writer continues: "Admitting that there exists a class of congenital opacities of the cornea apparently the result of fœtal keratitis the fact that the cornea is normally opaque well into the later months of pregnancy, acquiring its transparency only by degrees, seems to us to lend probability to the idea of arrested development. When embryologists have settled for us whether the cornea clears from center to periphery or from periphery to center we shall have made a long stride toward solving the etiology of this phenomenon."

"Congenital Opacities of the Cornea."

Dr. H. Moulton, Ft. Smith, Ark.

"My case was that of a boy 8 years old with total opacity of the left cornea, said by the parents to have been present since birth. They stated also that the opacity would sometimes clear up so that the outline of the pupil could be seen. There had been no inflammation about the eye at any time. The diameter of the cornea was less than that of its fellow. The other eye was myopic and amblyopic. There was thinning of the retina and choroid in the papillo-macular regions. There was no history of syphilis."

Embolism of the Central Artery of the Retina.

Dr. C. F. Clark, Columbus, Ohio.

The author reports several cases and then considers at some length whether or not we are warranted in concluding that true cilio-retinal vessels were the means of preserving the integrity of the papillo-macular area of the retina. "In answer to this question it may seem interesting, and, in view of the claims that have been repeatedly made in favor of this theory it is certainly surprising to note that in not one instance has the existence of what has been classed as a cilio-retinal vessel been demonstrated ophthalmoscopically. In not one was anatomical evidence adduced to prove that such a vessel was present, and, while our four writers claimed the existence of a cilio-retinal vessel, three of these in the context made it apparent that they did not distinguish between the cilio-retinal vessel and a macular vessel of deep origin. In conclusion I would say that beneath the statement of the time-honored theory that in embolism of the central artery a so-called cilio-retinal vessel serves to preserve the papillo-macular area by virtue of its origin in the choriodal system we must write "*not proven.*"

The Technique of Retinoscopy.

Dr. J. Ellis Jennings, St. Louis.

"The mirror which I use is plane, 2½ cm. in diameter with a central aperture 3 mm. in diameter cut through the glass. The annoying reflections from margins of the sight hole are obviated by using a very thin piece of glass well blackened about the aperture. The mirror is set in a piece of metal 5 inches long and 1¼ inches wide and over this is fastened another piece of metal which when closed protects the mirror from dust, and when open is used as a handle on the principle of a lorgnette. Either the right or left eye may be placed opposite the central aperture by merely reversing the piece of metal in which the mirror is set. In my experience the most brilliant and satisfactory light is the Argand burner or the Welsbach. I place it above the head of the patient and just far enough back to leave the eyes in shadow. I always work at one metre's distance. Dr. Jennings then exhibited an instrument which he calls a skiascope and which has been described in the *American Journal of Ophthalmology*. It contains a complete series of lenses and is easily manipulated at one metre's distance from the patient.

Anomalies of the Retinal Pigment Epithelium and their Clinical Significance.

Dr. H. Gradle, Chicago.

The special object of this paper was to call attention to the frequent occurrence of the granular pigmented appearance in the fundus of children and young people suffering from severe asthenopia. The author did not consider the changes in the pigment epithelium to be the direct cause of the asthenopia, yet he was of the opinion that they bore some direct relationship to each other.

Observations with the Binocular Lens for the Examination of the Eye by Oblique Illumination.

Dr. Edward Jackson, Philadelphia.

Dr. Jackson exhibited the binocular lens and demonstrated its use and the advantages it possessed over the ordinary lens in use for such examination.

Dr. Baker presented the following resolutions to the Society:

Whereas, many school children suffer from defective eyes, thus incapacitating them for the acquirement of a suitable education, and

WHEREAS, many street car drivers possess defective eyes and ears thus rendering them dangerous men for street car companies to employ and a menace to the public, and

WHEREAS, many locomotive engineers and firemen, possess defective eyes and ears, thus rendering them dangerous men for railroad companies to employ and a menace to the public, and

WHEREAS, the method of examining locomotive engineers and locomotive firemen by railroad employes, now generally in vogue, is totally inadequate and unsafe,

Therefore be it resolved that whenever the systematic examination of school children's eyes by skilled ophthalmic surgeons is not practicable the plan for the preliminary examination of school children's eyes by school principals, or other school authorities, is hereby indorsed and recommended by this section, and

Therefore be it resolved that in the opinion of this section companies operating street cars or other railroad systems should be required to submit their drivers, locomotive engineers and firemen to a scientific examination by reputable surgeons as to the condition of their vision, color sense and hearing and that such examinations should be made at intervals of not more than three years.

The two resolutions were considered separately, the first was adopted, and as there was some discussion over the wording of the second it was referred to a special committee consisting of Drs. Allport, Gifford and Clark, and this committee empowered to consider the subject and report at the next annual meeting.

THE EYESIGHT OF SCHOOL CHILDREN.

The environment of school children, with regard to its influence upon their eyes, must be carefully studied. In the structure of the school buildings, as few obstacles to vision as may be should be permitted; ample illumination, whether natural or artificial, should be had from the left side of the desks, the desks themselves should be of such sizes as to permit the pupils' feet to rest firmly upon the floor; they should be provided with comfortable backs and slightly slanting tops, the latter placed at such distances from the eyes as to render sight easy without the close approximation of books; the blackboards, maps, etc., should be so situated as to be readily seen; an erect style of handwriting, less irksome to the eye than slanting characters, should be taught; and frequent changes of study or intervals of intermission should be secured, so as to avoid the harmful effects of continuous work of one kind. —From "Defective Eyesight in American Children," by Dr. FRANK ALLPORT, in June *Review of Reviews.*

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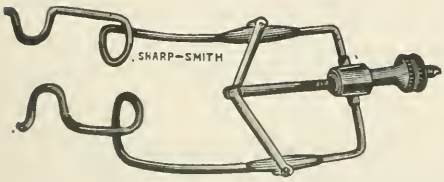

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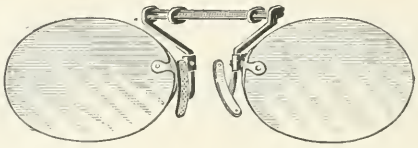

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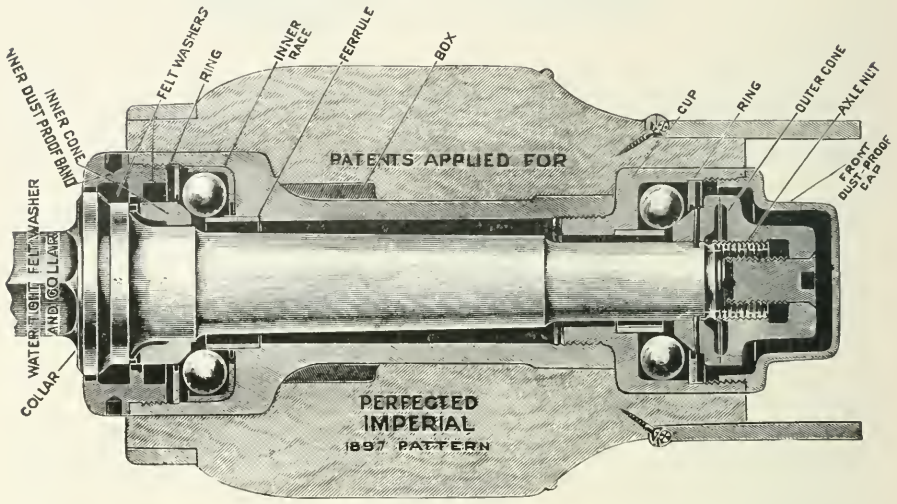

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